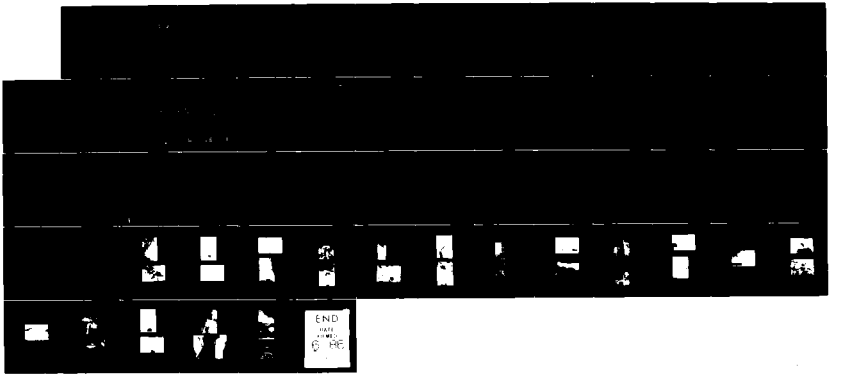
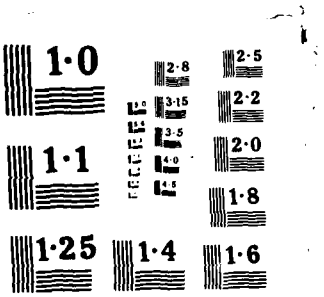
AD-A167 731 GUANTANAMO NAVAL STATION SEWER OUTFALL INVESTIGATION (U) NAVAL FACILITIES ENGINEERING COMMAND WASHINGTON DC CHESAPEAKE DIV J J O'BOYLE JUN 81 1/1

UNCLASSIFIED CHES/NAVFAC-FPO-1-81 (13) F/G 13/2 NL

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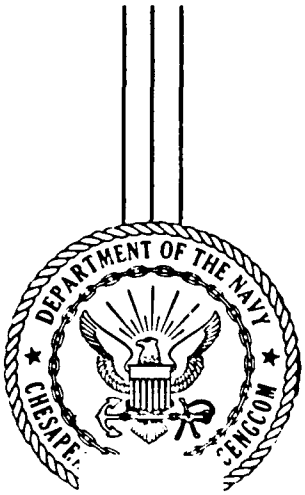


GUANTANAMO NAVAL STATION SEWER OUTFALL INVESTIGATION

BY
T. J. O'BOYLE

FPO-1-81 (13)
JUNE 1981

OCEAN ENGINEERING
AND CONSTRUCTION PROJECT OFFICE
CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
WASHINGTON,D.C. 20374

Unclassified AD-A167731
SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION
Unclassified

1b. RESTRICTIVE MARKINGS

2a. SECURITY CLASSIFICATION AUTHORITY

3. DISTRIBUTION AVAILABILITY OF REP.
Approved for public release; distribution is unlimited

2b. DECLASSIFICATION/DOWNGRADING SCHEDULE

4. PERFORMING ORGANIZATION REPORT NUMBER
FPO-1-81(13)

5. MONITORING ORGANIZATION REPORT #

6a. NAME OF PERFORM. ORG. 6b. OFFICE SYM
Ocean Engineering
& Construction
Project Office
CHESNAVFACENGCOM

7a. NAME OF MONITORING ORGANIZATION

6c. ADDRESS (City, State, and Zip Code)
BLDG. 212, Washington Navy Yard
Washington, D.C. 20374-2121

7b. ADDRESS (City, State, and Zip)

8a. NAME OF FUNDING ORG. 8b. OFFICE SYM

9. PROCUREMENT INSTRUMENT INDENT #

8c. ADDRESS (City, State & Zip)

10. SOURCE OF FUNDING NUMBERS

PROGRAM ELEMENT #	PROJECT #	TASK #	WORK UNIT ACCESS #

11. TITLE (Including Security Classification)
Guantanamo Naval Station Sewer Outfall Investigation

12. PERSONAL AUTHOR(S)
T.J. O'Boyle

13a. TYPE OF REPORT 13b. TIME COVERED FROM TO 14. DATE OF REP. (YYMMDD) 81-06 15. PAGES 48

16. SUPPLEMENTARY NOTATION

17. COSATI CODES FIELD	GROUP	SUB-GROUP

18. SUBJECT TERMS (Continue on reverse if nec.)
Sewage, Guanatanamo Bay, Cuba,

19. ABSTRACT (Continue on reverse if necessary & identify by block number)
This report deals with the investigatin and recommendations for extending some/all of 30 to 50 raw sewage outfalls to deeper water in Guanatanamo Bay.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT
SAME AS RPT.

21. ABSTRACT SECURITY CLASSIFICATION

22a. NAME OF RESPONSIBLE INDIVIDUAL
Jacqueline B. Riley

22b. TELEPHONE
202-433-3881

22c. OFFICE SYMBOL

DD FORM 1473, 84MAR

SECURITY CLASSIFICATION OF THIS PAGE

GUANTANAMO NAVAL STATION
SEWER OUTFALLS INVESTIGATION

JUNE 1981

By T. J. O'Boyle

Approved: S. Ling, Director
Engineering Analysis
Division

Approved: E. Spencer
Technical Director

Ocean Engineering and Construction Project Office
Chesapeake Division
Naval Facilities Engineering Command
Washington, DC 20374

21 July 1981

TRIP REPORT

From: FPO-1EA6
To: FPO-1EA

Subj: Guantanamo Naval Station Sewer Outfalls Investigation

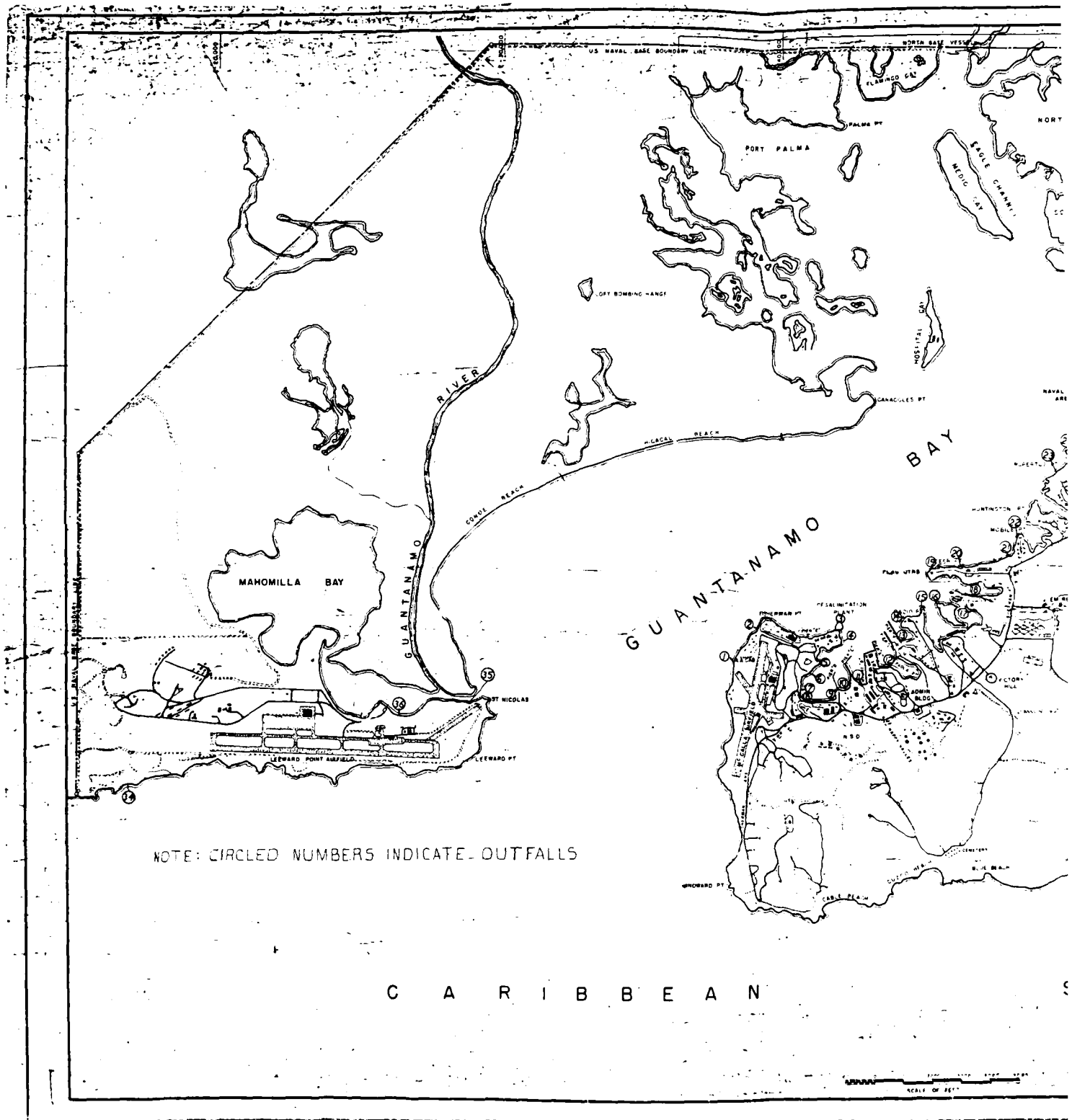
Ref: (a) Engineering Service Request (ESR) Number 81-03 of 2 Mar 1981
(b) Phonecon between S. Ling, CHESDIV and LCDR T. Best, Guantanamo on 8 May 1981

Encl: (1) Copy of reference (a)
(2) Copy of reference (b)
(3) Detailed location of the sewage outfalls
(4) Drawings of the repairs made to the outfalls
(5) Photos taken during the inspections

1. On 23 March 1981, CHESDIV (FPO-1), received an Engineering Service Request (reference (a); enclosure (1)), to investigate and make recommendations for extending some/all of the 30 to 50 raw sewage outfalls at Guantanamo Naval Station. During reference (b) it was agreed that a fact-finding visit would be necessary to ascertain the extent of the problem. To perform the aforementioned fact-finding investigation, Mr. T. O'Boyle, from CHESDIV (FPO-1) arrived at the Guantanamo (GTMO) Naval Station on 15 June 1981, to depart on 19 June 1981.

2. On Monday, 15 June 1981, I arrived at the Guantanamo Naval Air Station and was met by Mr. Manning Trewitt from the Public Works Department's Engineering Office. After registering at the BOQ and signing out my vehicle, we returned to the Engineering Office where I met with LCDR Tom Best and discussed the job. I explained what I wanted to do while I was there, and I requested that a funding document, in the amount of $3,000 to cover the cost of this trip and preparation of the ESR response be prepared so I could hand carry it back. I explained that I planned to look at and photograph all the outfalls first by land and then look at them by water. The necessary arrangements were made so I could start the inspections the next morning.

3. The next morning, Tuesday, 16 June 1981, after arriving at the office, I asked Mr. Trewitt if the set of drawings his office sent me included everything I was to look at. After comparing my drawings with a set of utility drawings showing the sewer system, it was realized that all the outfalls of interest were not indicated in my set of prints. Therefore, on a clean set of these utility drawings showing the sanitary sewerage system, Mr. Trewitt and I decided on and numbered all the outfalls of interest. All 36 outfalls can be seen on Figure 1. For a more detailed location of these outfalls refer to the figures in enclosure (3). Table 1 lists the outfalls by number, location and size for identification purposes.



NOTE: CIRCLED NUMBERS INDICATE OUTFALLS

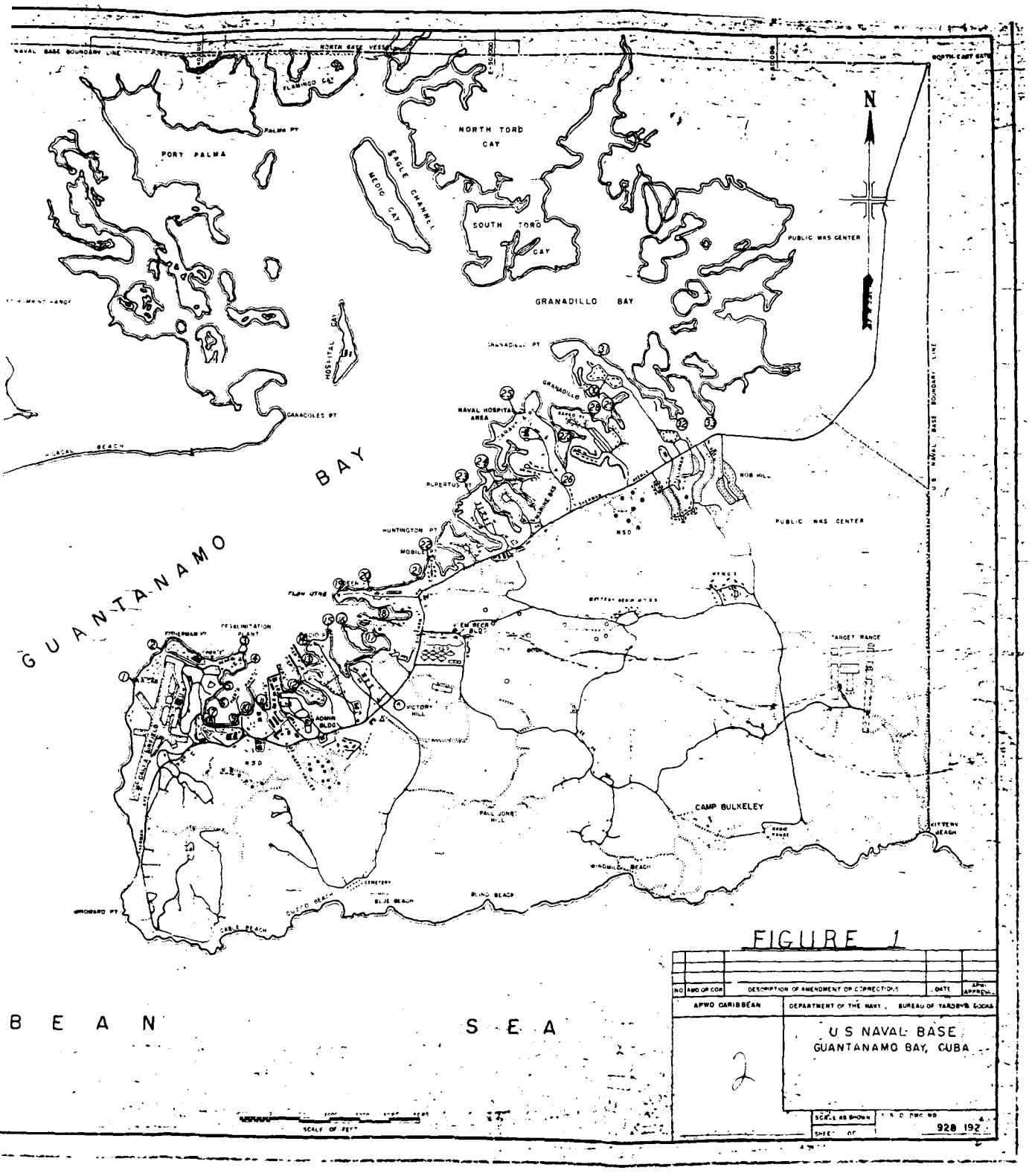


FIGURE 1

NO	AMD OR COR	DESCRIPTION OF AMENDMENT OR CORRECTION	DATE	APPROVED

APWO CARIBBEAN | DEPARTMENT OF THE NAVY, BUREAU OF YARDS & DOCKS

U S NAVAL BASE
GUANTANAMO BAY, CUBA

2

SCALE AS SHOWN | DATE DEC 50

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928 192

TABLE 1

GUANTANAMO NAVAL STATION
EXISTING SEWER OUTFALLS
FOR INVESTIGATION UNDER ESR 81-03

NUMBER	LOCATION	SIZE
1.	McCalla Airfield	10" Clay
2.	Desalinization Plant, Bldg 1650	Not Located
3.	Corinaso Point Housing (Old #3 not used)	8" (New #3)
4.	Corinaso Point, Bldg AV-102	10" Not used anymore
5.	Corinaso Point, Bldg RB-22	10"
6.	Corinaso Point, Bldg AV-72	10"
7.	Corinaso Point, Bldg AV-109	6"
8.	Wharf 40	8"
9.	Landing No. 38	10"
10.	Landing No. 37, Bldg 715	12" to a new 8"
11.	Wharf "U"	6"
12.	Wharf "X"	4"
13.	Wharf "W"	a. 12" b. 6"
14.	Radio Point, Bldg 1396	8" Broken
15.	Radio Point, Bldg 720	8"
16.	Lizard Island, Bldg 1658	10"
17.	Evans Point Landing No. 11	6"
18.	Evans Point Landing No. 8	8"
19.	Deer Point, Bldg 1101	10"
20.	Deer Point, Bldg 932	12"
21.	Yacht Club/Teen Club, Bldg 687	14"
22.	Mobile Point, Bldg 399	8"
23.	Rupertus Point, Bldg M-227	8"
24.	Marina Point, Bldg N-303	8"
25.	Caravela Point, Bldg H-1	8"
26.	Caravela Point, Bldg CP-5	1½"
26a.	Caravela Point	8"
28.	Center Bargo Point, Bldg CB-1218	10"
29.	East Bargo Point, Bldg EB-6	12"
30.	Granadillo Point, Bldg 1035	8"
31.	Granadillo Point, Bldg GP-3	6"
32.	Granadillo Point, Bldg GP-11	10" Clay
33.	Villamar/Nob Hill Housing	18"
34.	Leeward Point, Housing & Flightline	20"
35.	Leeward Point, Bldg 596	6"
36.	Leeward Point, Bldg AV-530	8"

4. EAl Jim Strickland assisted me in the location and inspection of all the outfalls. Jim knew the base well and using the set of prints showing the outfalls of interest was able to drive to where the outfalls should be. We were able to locate and inspect 27 of the 36 outfalls on Tuesday, 16 June 1981. The results of this part of the investigation are summarized in Table 2. The drawings of the repairs that show the added new plastic pipe can be found in enclosure (4). The photos taken during the inspections can be found in enclosure (5).

5. On Wednesday, 17 June 1981, Jim Strickland and I finished the land inspection of the outfalls on the main side of the base. The three outfalls on the Leeward Point side would be inspected by land on Thursday. A small boat was reserved for Wednesday afternoon so the water inspection could be conducted.

6. Wednesday afternoon was dedicated to the water inspection, but only outfalls 3-30 could be inspected. We could not go out of the Bay past Corinaso Point and could not go any further back than Granadillo Point because of the live firing. The water inspection indicated that the offshore ends of the outfalls, that could be seen were clear of obstructions. The results of the water inspection are also summarized in Table 2.

7. At the conclusion of the water inspection, I returned to the Engineering Office to meet with Mr. Bill Slone. Bill is a Mechanical Engineer and has done a lot of work concerning the sewers at GTMO. Bill agreed that I was doing everything I could for this investigation. Bill had no suggestions for additional work that I should be doing.

8. Prior to getting on the ferry Thursday moring, 18 June 1981, to cross over to Leeward Point, I tried to locate the outfall that was reported to be by the intake of the desalinization plant. All that was found was a section of plastic repair pipe on the beach that appeared to have had its coupling broken off of an outfall, but I could not tell where the actual outfall was. There were barges tied up in the area and at some time this could have been the cause of the separation of the plastic pipe from the original outfall.

9. The three outfalls on the Leeward Point side were inspected from the land only. This took the entire morning with the time needed for the ferry crossings.

10. Thursday afternoon I first debriefed Mr. Trewitt and then we met with CAPT C. Gibowicz and LCDR T. Best. At this meeting I explained what I had done and what was found from the land and water inspections. I explained that from my observations of the large deposits of silt and sludge at the ends of most of the outfalls, there did not appear to be any current flushing of the areas. I also said that I felt a current study should be conducted before/if the outfalls were extended. The data from such a study would aid the engineer in deciding

TABLE 2

SUMMARY OF THE GUANTANAMO NAVAL STATION
SEWER OUTFALL INVESTIGATION (ESR 81-03)

OUTFALL NUMBER	FINDINGS FROM THE LAND INSPECTION	FINDINGS FROM THE WATER INSPECTION
1.	There is sewage flowing out of a 10" clay pipe at the top of a cliff.	N/A
2.	Could not locate.	N/A
3.	Looked at the old outfall that is not used.	Looked at the new repair but is not connected to outfall.
4.	Outfall looks good but there is no building AV-102.	Outfall okay but building AV-102 is gone.
5.	Shore end looks good with new plastic pipe added. Also, there is an old 10" C.I. outfall in same area with no plastic pipe added.	End of plastic outfall looks clear. End of C.I. outfall out of water.
6.	Shore end looks good with new plastic pipe added.	End of outfall looks clear.
7.	Shore end looks good with new plastic pipe added.	End of outfall looks clear.
8.	Shore end looks good with new plastic pipe added.	Leaking at plastic/C.I. flange, could not see end.
9.	Could only find one 10" outfall.	The end is approximately half out of the water.
10.	The outfall is entirely under water and could not see.	The water was too deep and cloudy to see the end.
11.	The outfall is entirely under water and could not see.	The water was too deep and cloudy to see the end.
12.	The end of the outfall is at the water line.	No flow was evident.
13.	The outfalls end at the bulkhead, could not actually see them.	There are two outfalls flush with the bulkhead.
14.	The C.I. pipe is broken prior to going into the water.	There is no evidence that this outfall is now used.
15.	Looks good as it enters the water.	End of the outfall looks clear.

16.	Looks good as it enters the water.	Water too cloudy to see the end.
17.	Looks good as it enters the water.	Water very dirty, cannot see end but see a disturbance from outfall discharge.
18.	New plastic pipe connection is broken at the C.I. pipe.	No flow evident, could not see end.
19.	Shore end looks good with new plastic pipe added.	End of outfall looks clear.
20.	The new plastic pipe came apart from the C.I. pipe at the connection.	End of outfall looks clear.
21.	New pipe added but there is a section cut out of plastic pipe at the shore	Could not see end because there was a barge in the way.
22.	Shore end looks good with new plastic pipe added.	End of outfall looks clear.
23.	New C.I. outfall.	End of outfall clear but just below the waterline.
24.	Could not get to the outfall because of thick brush.	Can see new plastic pipe as it enters the water but can not see the end.
25.	New C.I. outfall.	End of outfall at the waterline at low tide.
26.	Small 1½" steel pipe outfall that comes from a manhole below the brig and ends above water.	N/A
26a.	New plastic pipe outfall near #26.	Water too deep to see the end.
27.	Can not find the outfall by land.	Outfall is in a different location than shown on the drawings. New plastic pipe. Can not see end because the water is too deep.
28.	Outfall at the water looks good but a tank up the line is overflowing.	Water is too dirty to see the end.
29.	Pipe is separated before it enters the water.	The end is just below the water line.
30.	The coupling between the plastic pipe and the C.I. looks like it is about to come apart.	The end is around some submerged branches.

31.	The outfall and new plastic pipe look good but a tank up the line is overflowing.	N/A
32.	The outfall is a 10" clay pipe that is separated and ends prior to entering the water.	N/A
33.	Long 18" steel outfall that ends above water. Large accumulations of black sludge.	N/A
34.	24" steel pipe, cracked just before entering water.	N/A
35.	Could not get close, looks like 12" new plastic pipe added.	N/A
36.	Shore end looks good with new plastic pipe added.	N/A

how far and in what direction the outfalls should be extended, if at all. I also mentioned that prior to this trip, I had contacted various agencies, (NAVOCEANO, NORDA, NOAA, NCSC & Army Corps of Engineers) in search of current studies that may have been done on Guantanamo Bay. This search had proved futile but I did learn that NCSC had the equipment and would be available to do a current study after the middle of July 1981. I did not have a cost estimate for NCSC to do this work but I said, upon my return to CHESDIV, I would contact NCSC and ask them for a cost estimate for such a study. LCDR Best said he would contact me so I could give him this information. During this meeting, I agreed with LCDR Best that immediate attention should be directed to maintaining all their septic tanks. This would include locating, pumping, repairing and cleaning them. After this immediate action, a regular maintenance schedule should be established. This action may help to reduce their problem but the consultation of a sanitary engineer is recommended.

11. I departed Guantanamo Naval Air Station, Friday, 19 June 1981.

Thomas J. O'Boyle

Copy to:
PWO, Guantanamo Bay, Cuba
CDR R. N. Endebrock, LANTDIV
FPO-1A
FPO-1EA
FPO-1EA6
Daily

ENGINEERING SERVICE REQUEST (ESR)
NAVFAC 11000/7 (4-78)
Supersedes NAVDOCKS 2038
S/N 0105-LF-011-0035

Instructions on Reverse

Copy To:

1 FROM (Activity and location)

U. S. Naval Station, Guantanamo Bay, Cuba

2 TO Commanding Officer, Chesapeake Division, Naval Facilities Engineering Command, Ocean Engineering Division, Washington Navy Yard, Washington D.C. 20374

3 REFERENCE(S)

4 ESR IDENTIFICATION NUMBER (if applicable)

5 ENCLOSURE(S) (check)
- [ ] NAVCOMPT 140
- [ ] NAVCOMPT 2080
- [ ] NAVCOMPT 372
- [ ] OTHER (specify)

6 TYPE OF FUNDING (check)
- [X] O&MN
- [ ] NIF
- [ ] NAF
- [ ] OTHER (specify)

7 TYPE OF SERVICES REQUESTED

ENGINEERING INVESTIGATION

8 DESIRED COMPLETION DATE

JULY 81

9 DESCRIPTION OF WORK

Investigate and make recommendations for extending some/all of 30 to 50 raw sewage outfalls to deeper water in Bay. Recommendations must be sufficient detail to submit Step II Facilities Special Project (or MILCON Project as necessary) to Commander-in-Chief, U. S. Atlantic Fleet, Norfolk, VA 23511. Shallow diving may be necessary. LCDR T. Brandenberg of UCT One has additional information. This request to CHES DIV has been discussed with CDR R. N. Endebrock at LANTDIV.

SECTION A FOR USE BY REQUESTER

10 FOR INFORMATION CONSULT (Name and phone)

L. H. DODD-AV723-3960 ext. 8203

11 OFFICIAL REPRESENTATIVE (Signature)

LCDR T. D. BEST

12 DATE

2 MAR 81

SECTION B FOR USE BY FPO

1 SCOPE OF SERVICES CHESDIV (FPO-1) will send a representative, Mr. T. O'Boyle to conduct an investigation of all the sewer outfalls of interest. Mr. O'Boyle will prepare a trip report that will include his findings and recommendations of how far (if at all) to extend the outfalls. Also, the report will include any additional studies that are recommended.

2 DATE RECEIVED

21 MAR 81

3 ESR NUMBER

81-03

SECTION C INTERIM ENDORSEMENT

1 REMARKS

2 ESTIMATED COMPLETION DATE

24 JUL 81

3 AUTHORIZED REPRESENTATIVE (Signature)

4 DATE

24 Sept. 81

SECTION D FINAL ENDORSEMENT

1 ENCLOSURE(S)
- [ ] DRAWINGS AND MAPS
- [ ] SPECIFICATIONS
- [X] REPORT
- [ ] OTHER (specify)

2 EST COST (if applicable)

$ N/A

3 AUTHORIZED REPRESENTATIVE (Signature)

4 DATE OF COMPLETION

COPY TO

LANTNAVFACENGCOM

TELEPHONE CONVERSATION RECORD

INSTRUCTIONS

Legible hand written copy acceptable
This paper does not require carbon. Tear off number of copies required BEFORE writing.

DATE	5-8-81
LOCAL TIME	0745

ORIGINATOR OF CALL (Name)	(Title)	(Location)
Shun Ling	Br. Mgr.	

PERSON CALLED (Name)	(Title)	(Location)
LCdr. Tom Best		

SUBJECT

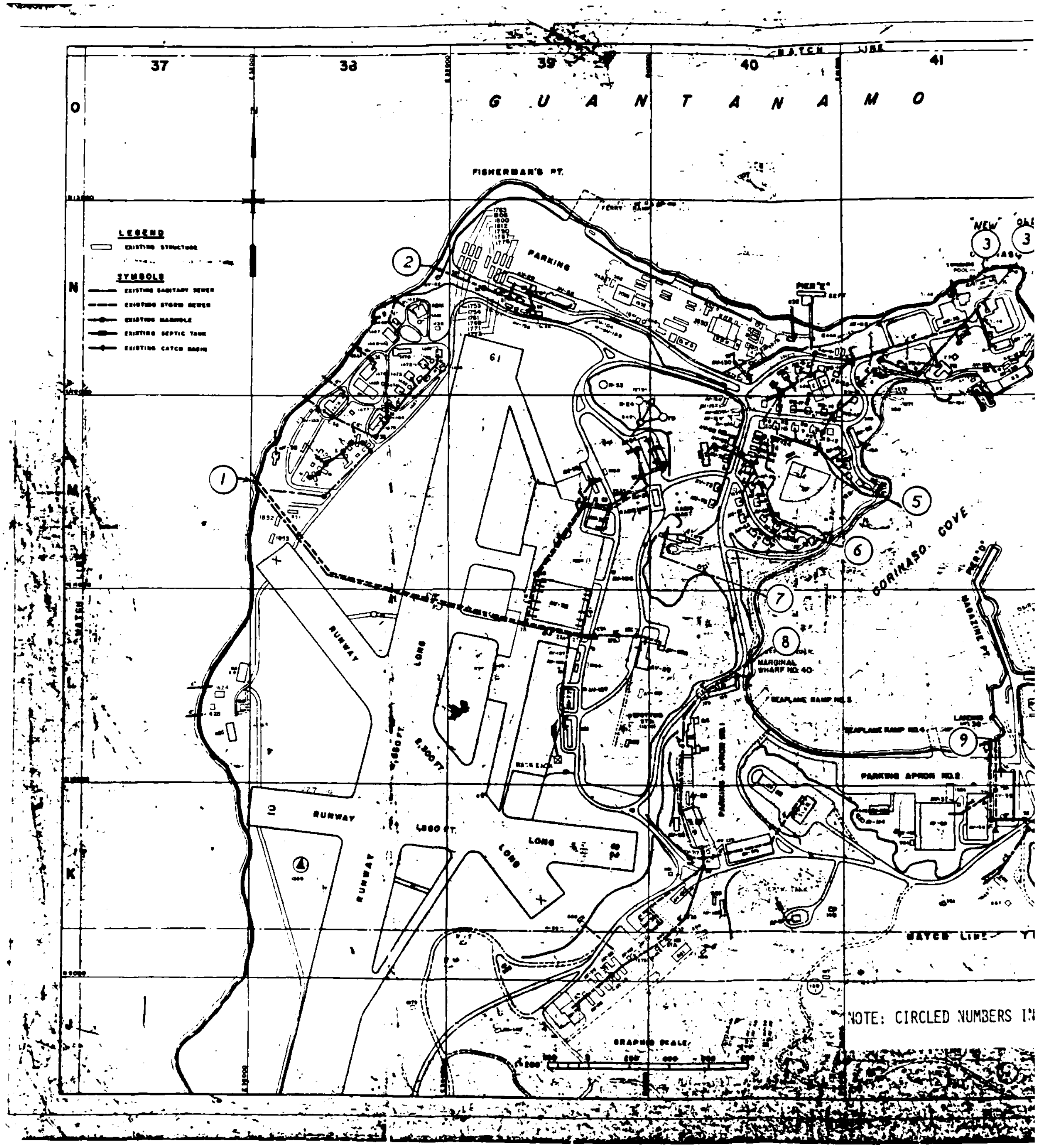
ESR for Investigation of Sewer Outfall Sit'n.

BRIEF OF CONVERSATION

1. Tom notes there is an MCON submitted for $17M for full term soln to outfall problem - includes sewage treatment. Low in priority. Odds of occurrence are nil.
2. His ESR request to us is seeking a much lower magnitude solution, e.g. $100K plus with use of CB labor.
3. With his experience at LANTDIV, Tom is not in favor of model studies per se. Sounds like he'd would proceed w/a practical recommendation that had a likelihood of resolving part of the problem.
4. Discussed approach would involve an on-site visit to see (small) full extent of problem, agree on priority areas for initial resolution, possibility of some current profile measurements in select areas, brainstorm some technical options, develop proposal & estimates of cost and time.
5. Tom was agreeable to us coming back to him with request for seed money to include travel to GITMO for initial visit. Also agreeable to more than one visitor in case we wanted a biologist, etc. with us. He is concerned about health aspects. Also for desalinization plant site ~~potential~~ affected.

SIGNATURE OF PARTY ORIGINATING/RECEIVING CALL

Shun Ling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MAGAZINE PT.
MARGINAL WHARF NO. 40
SEAPLANE RAMP NO.3
SEAPLANE RAMP NO.4
PARKING APRON NO.1
PARKING APRON NO.2
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GRAPHIC SCALE
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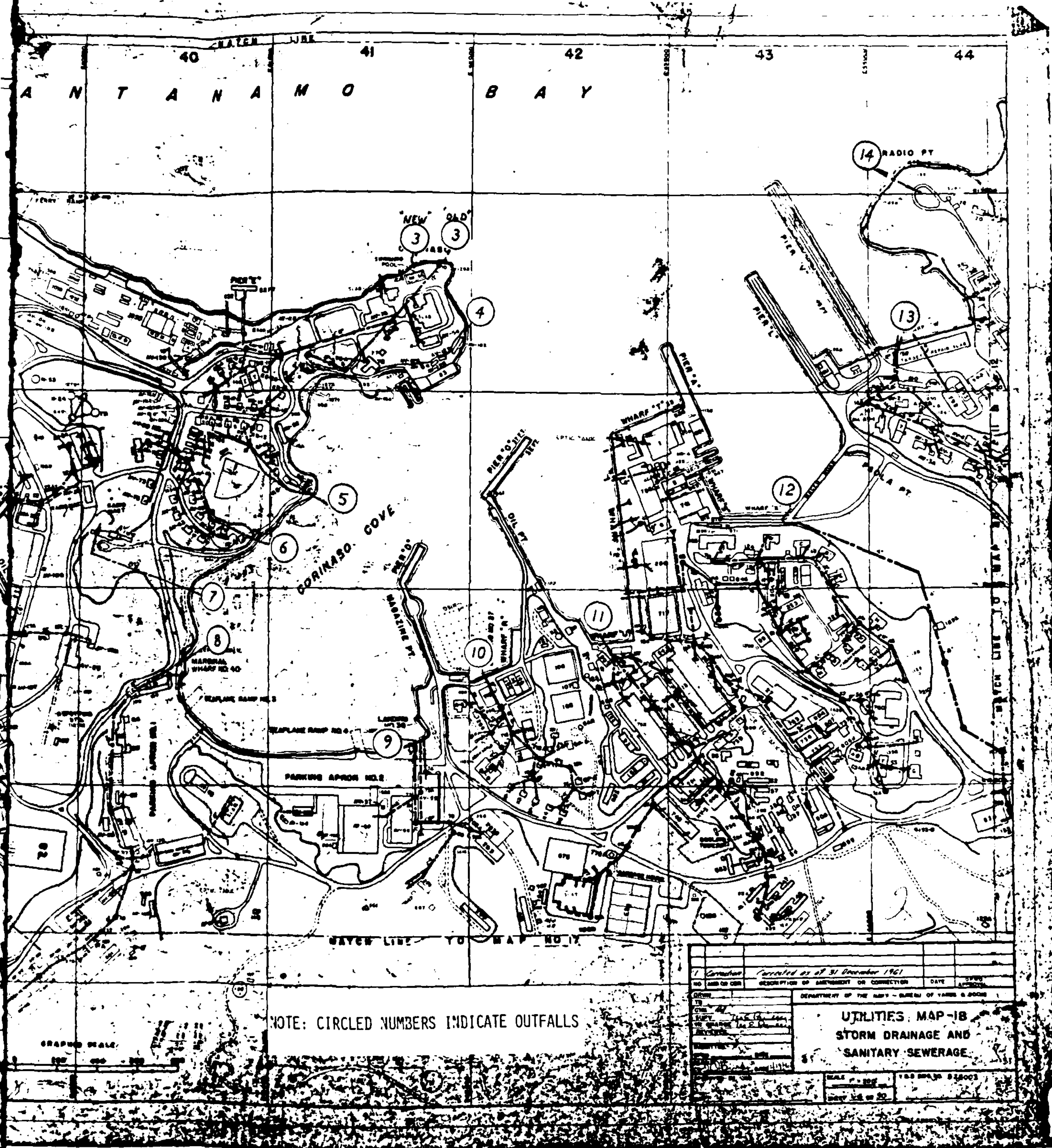
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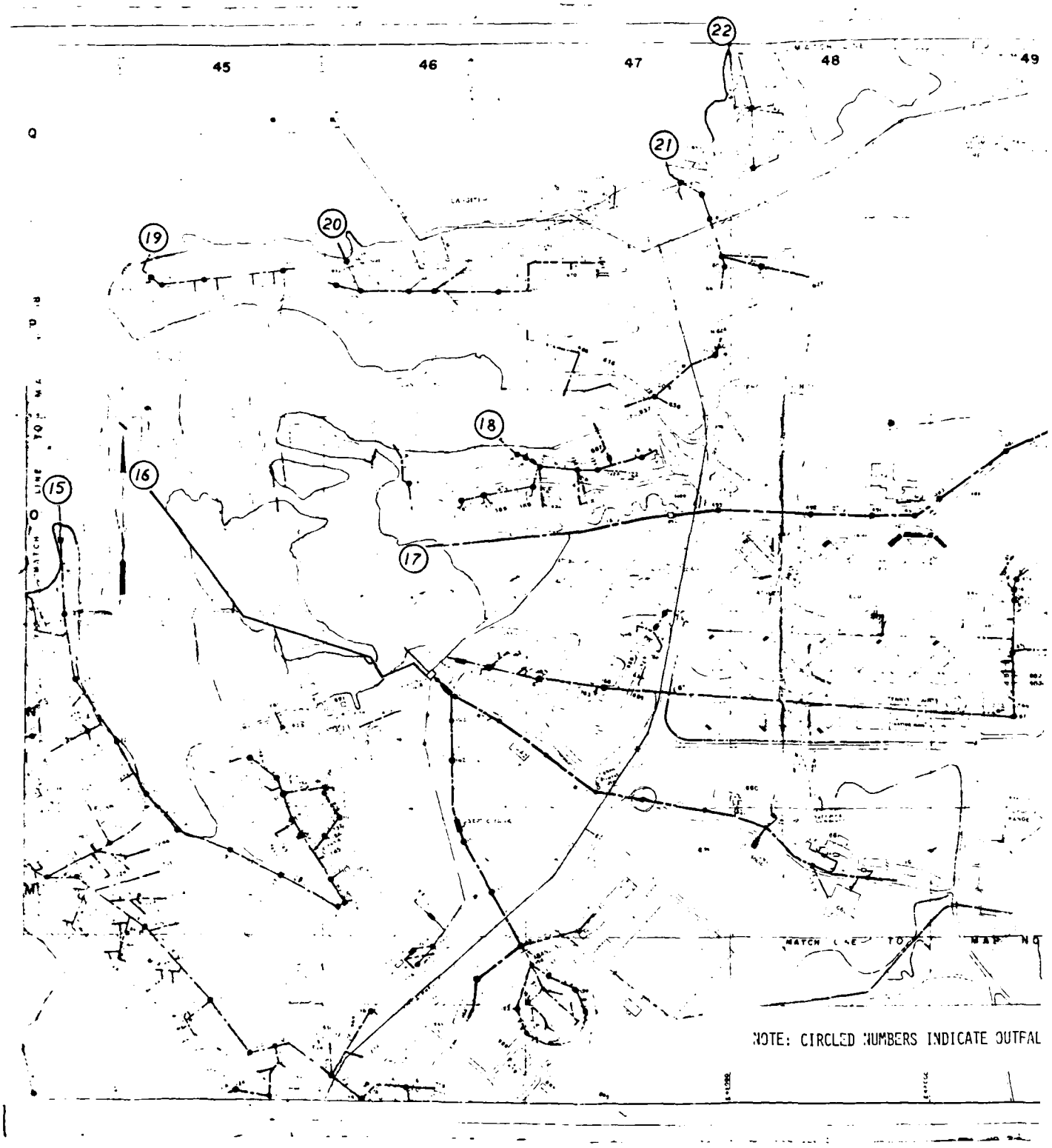
WHARF "B"
OIL PT
MAGAZINE PT
MARGINAL WHARF NO. 40
SEAPLANE RAMP NO. 3
SEAPLANE RAMP NO. 4
PARKING APRON NO. 2
WATCH LINE TO MAP NO 17
1 Correction Corrected as of 31 December 1961
NO. DESCRIPTION OF AMENDMENT OR CORRECTION DATE
UTILITIES MAP-18
STORM DRAINAGE AND
SANITARY SEWERAGE
NOTE: CIRCLED NUMBERS INDICATE OUTFALLS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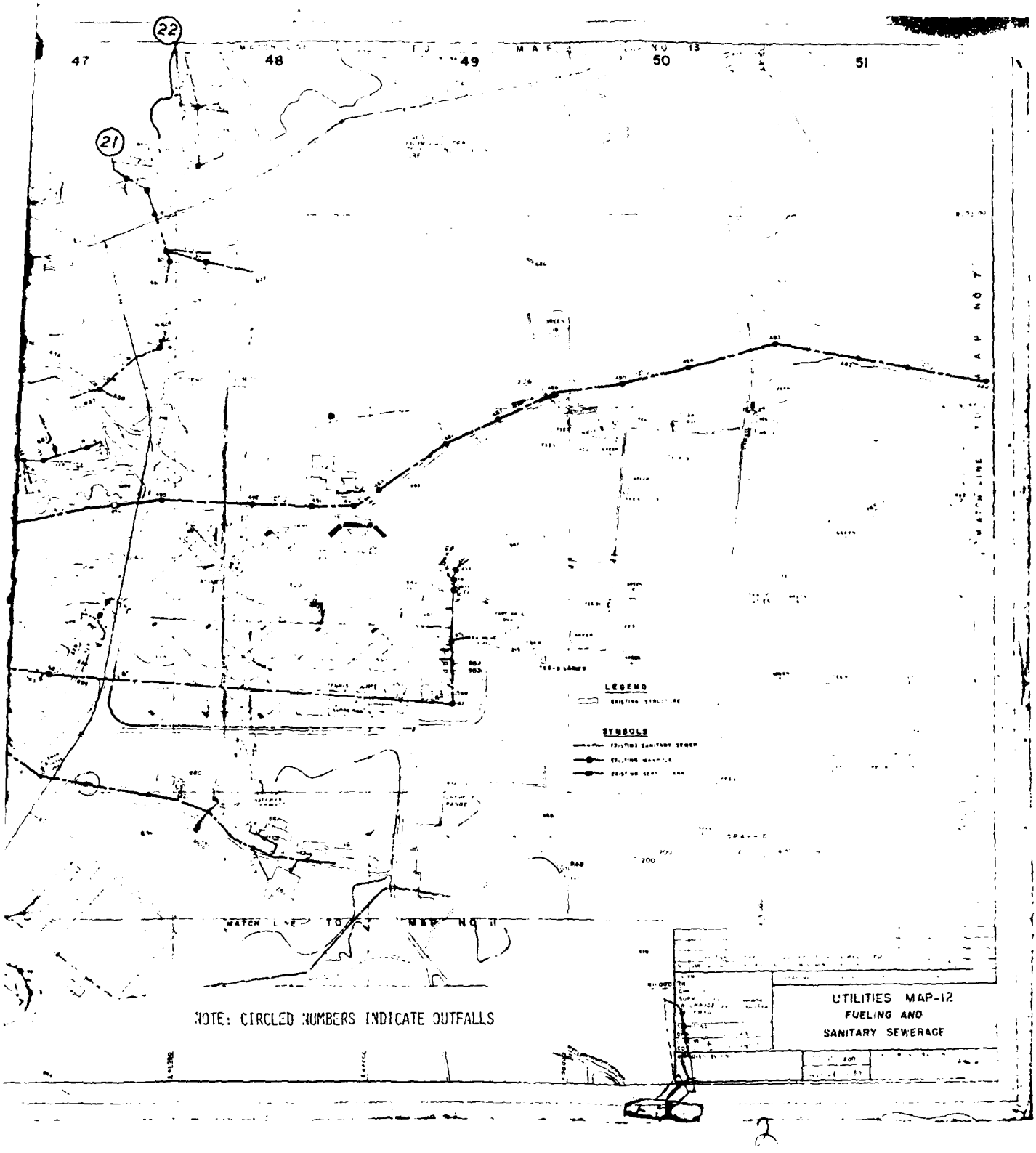
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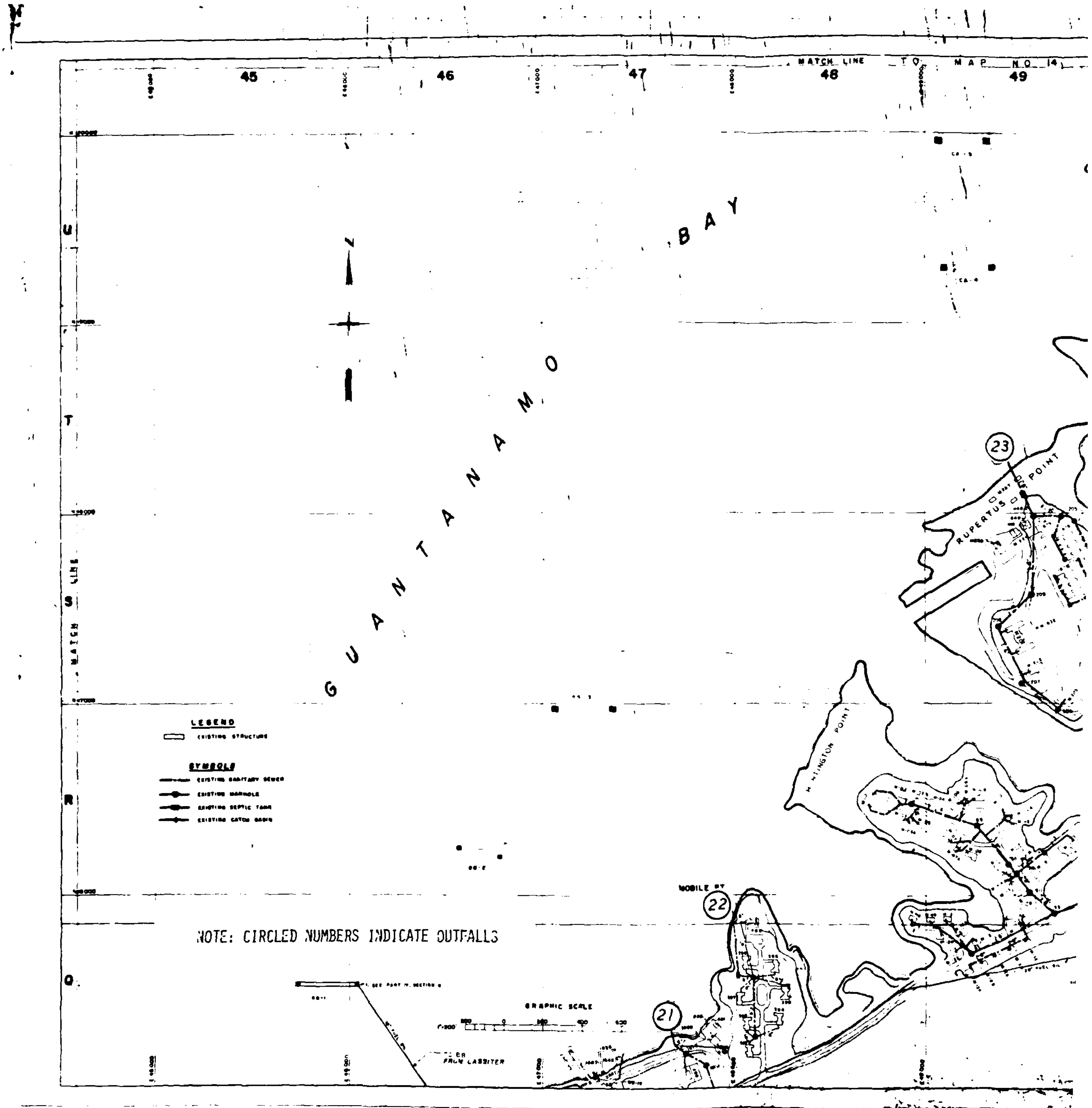
NOTE: CIRCLED NUMBERS INDICATE OUTFALLS
UTILITIES MAP-12
FUELING AND
SANITARY SEWERAGE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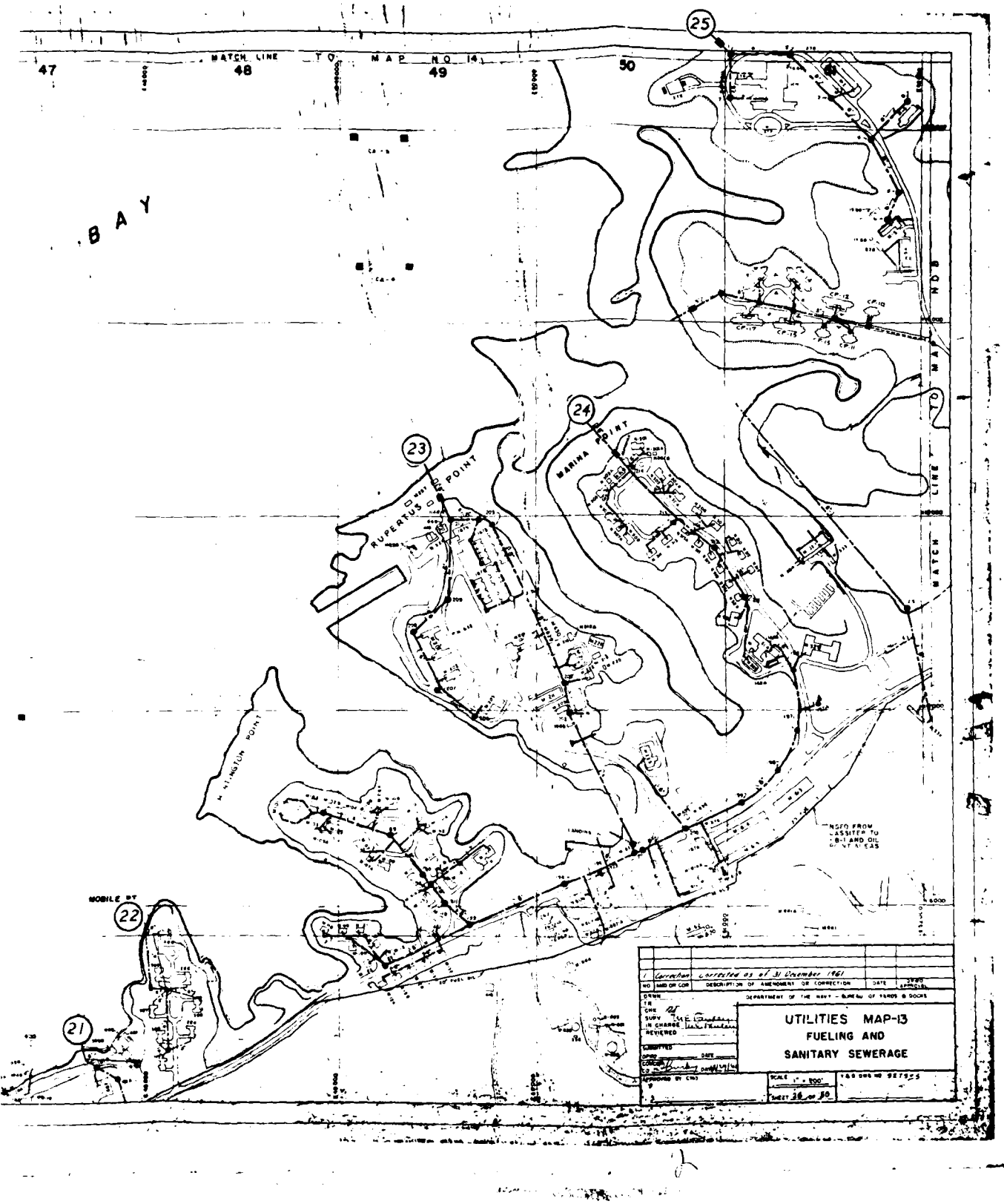
NOTE: CIRCLED NUMBERS INDICATE OUTFALLS


MATCH LINE TO MAP NO 14
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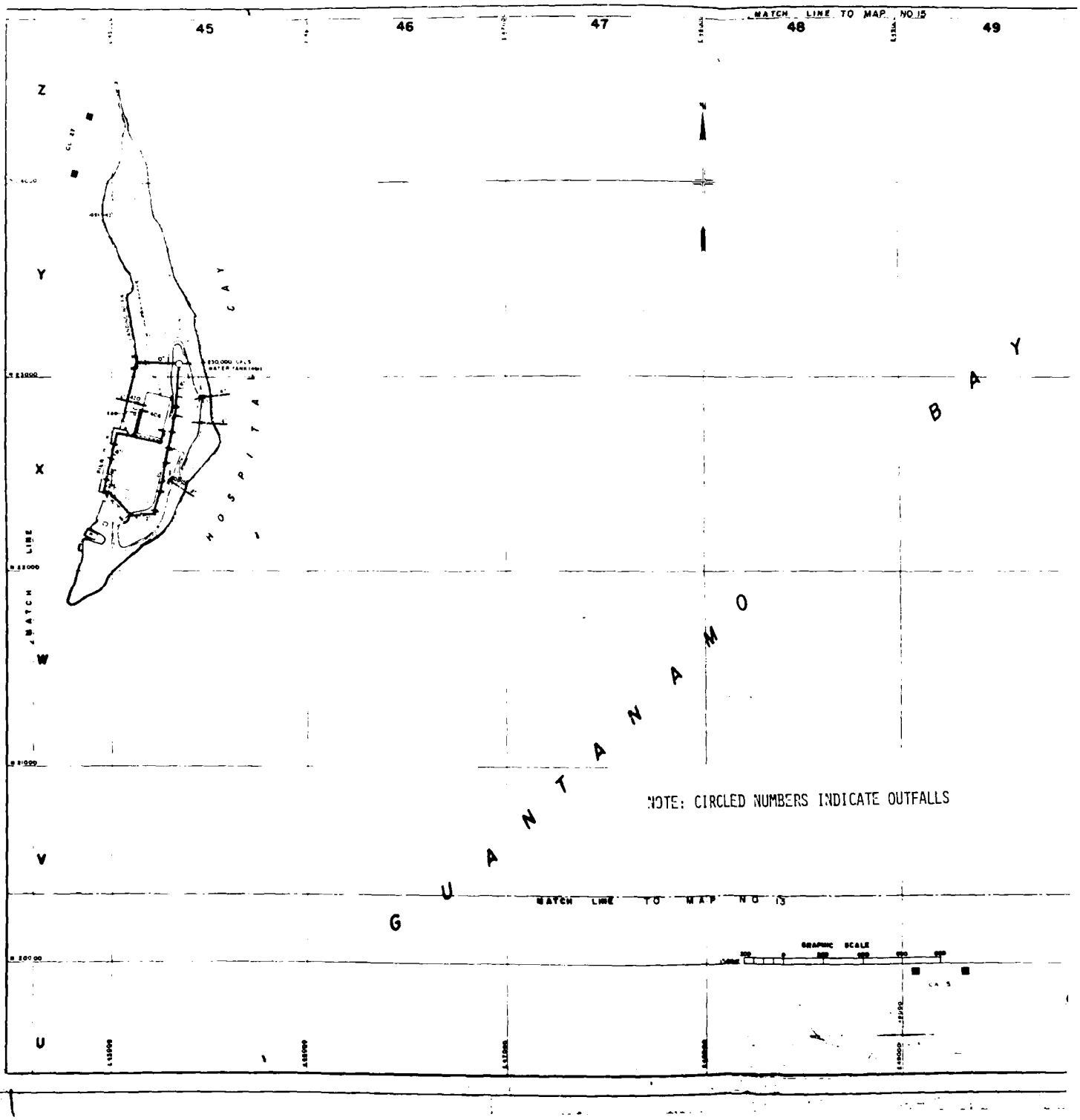
RUPERTUS POINT
MARINA POINT
WASHINGTON POINT
MATCH LINE TO MAP NO 8
MOBILE BY
UTILITIES MAP-13
FUELING AND
SANITARY SEWERAGE
Corrected as of 31 December 1961
DESCRIPTION OF AMENDMENT OR CORRECTION
DATE
DEPARTMENT OF THE NAVY - BUREAU OF YARDS & DOCKS
SCALE 1" = 200'
SHEET 38 OF 50


MATCH LINE TO MAP NO 15
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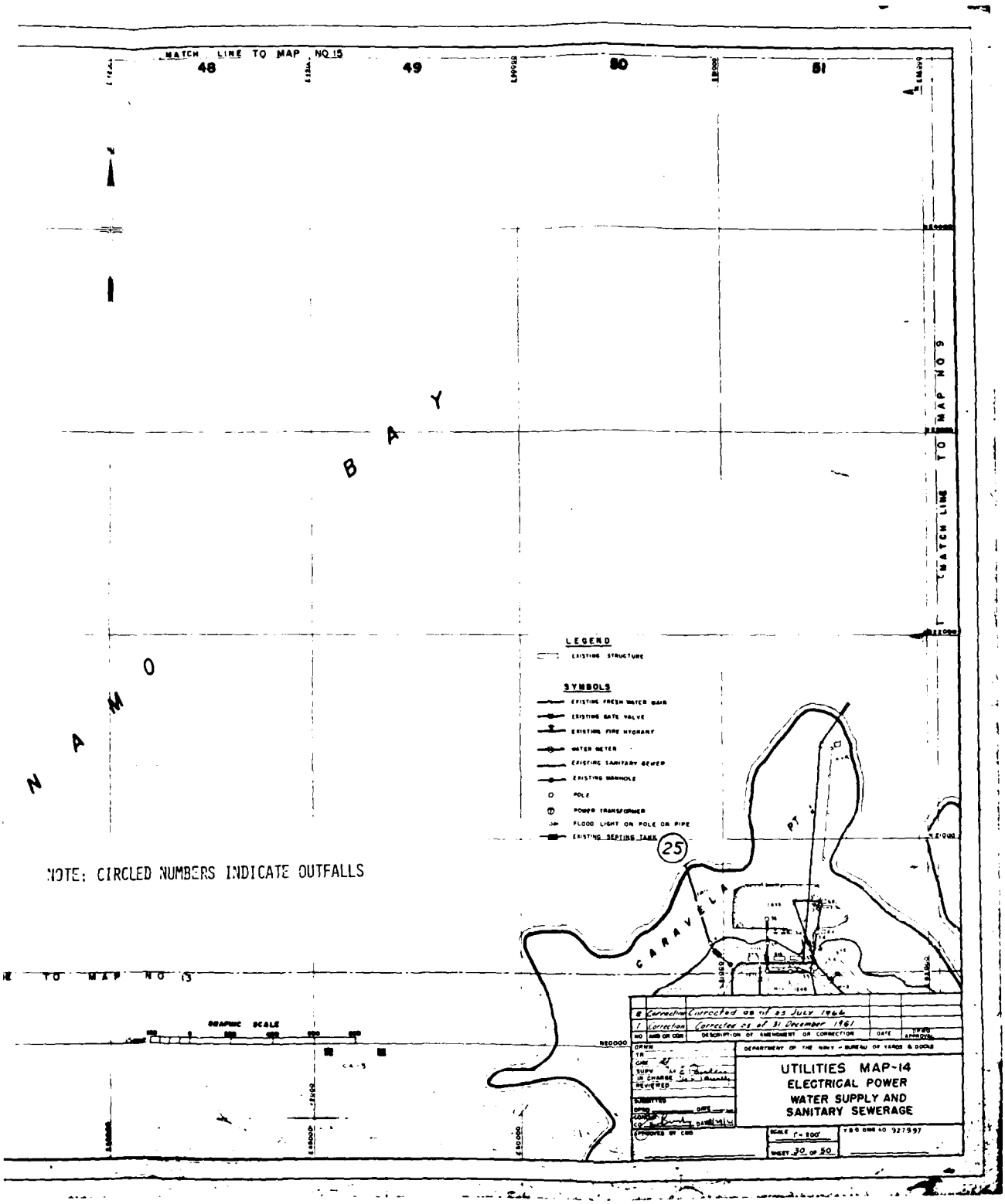
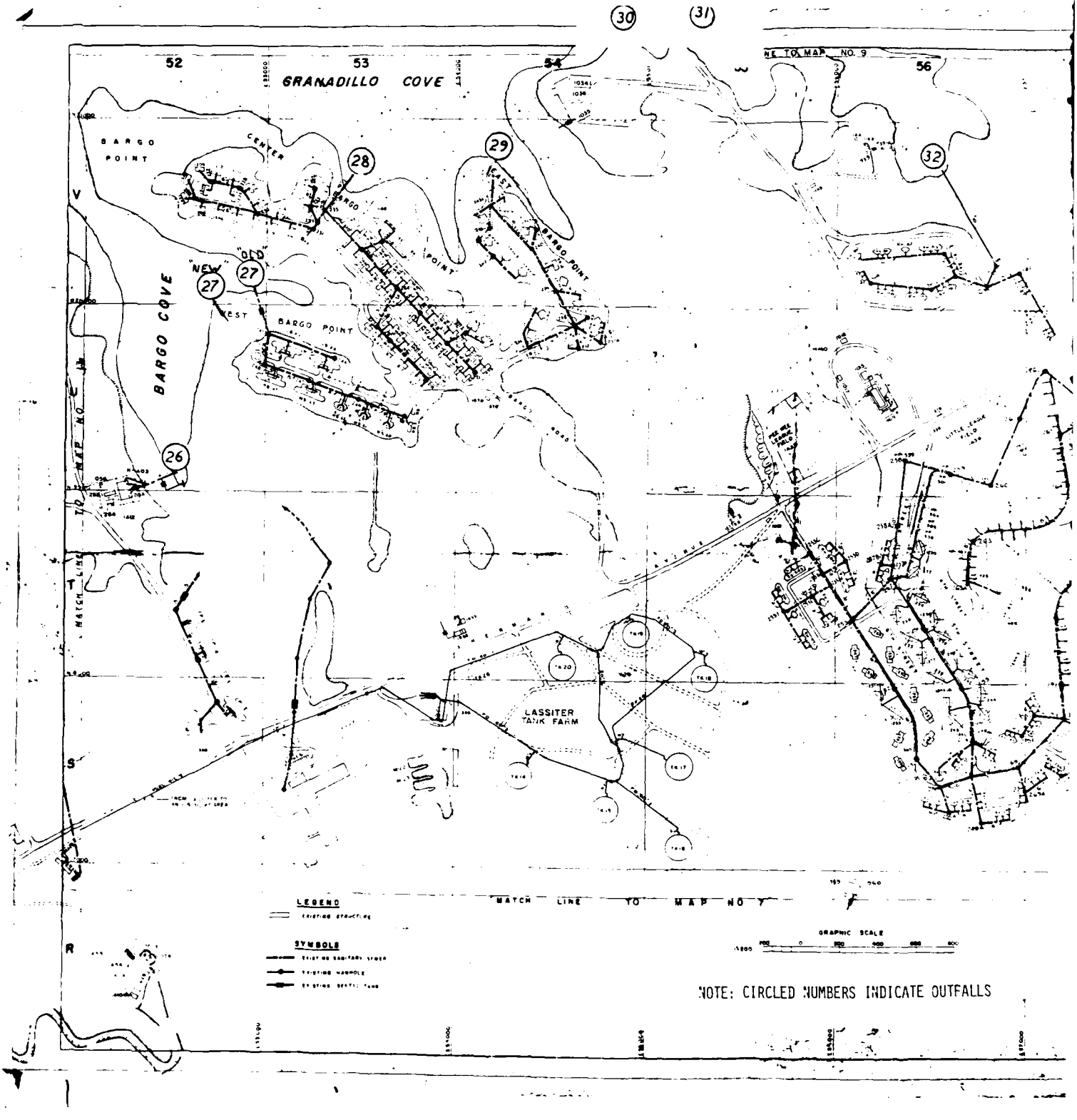
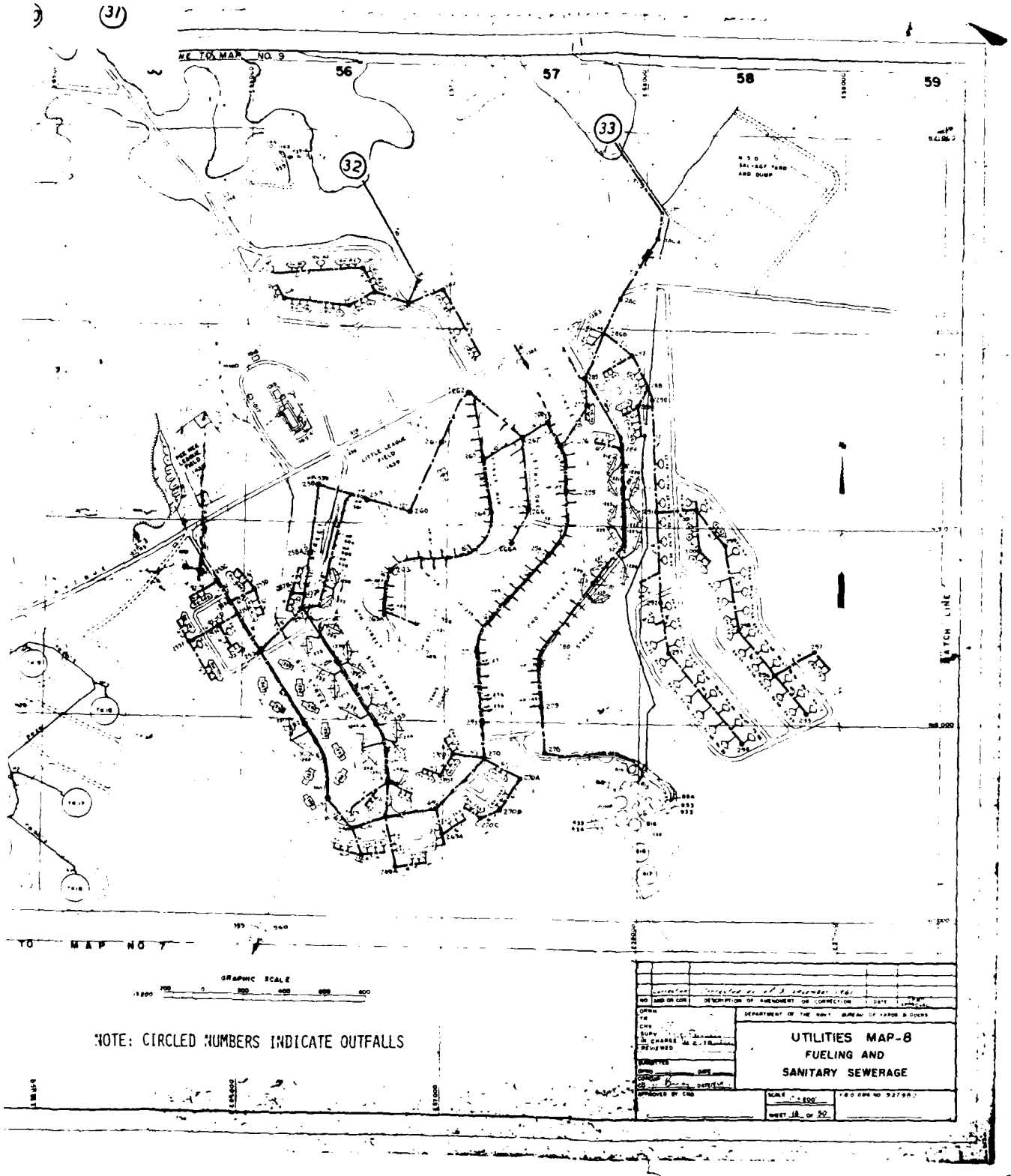
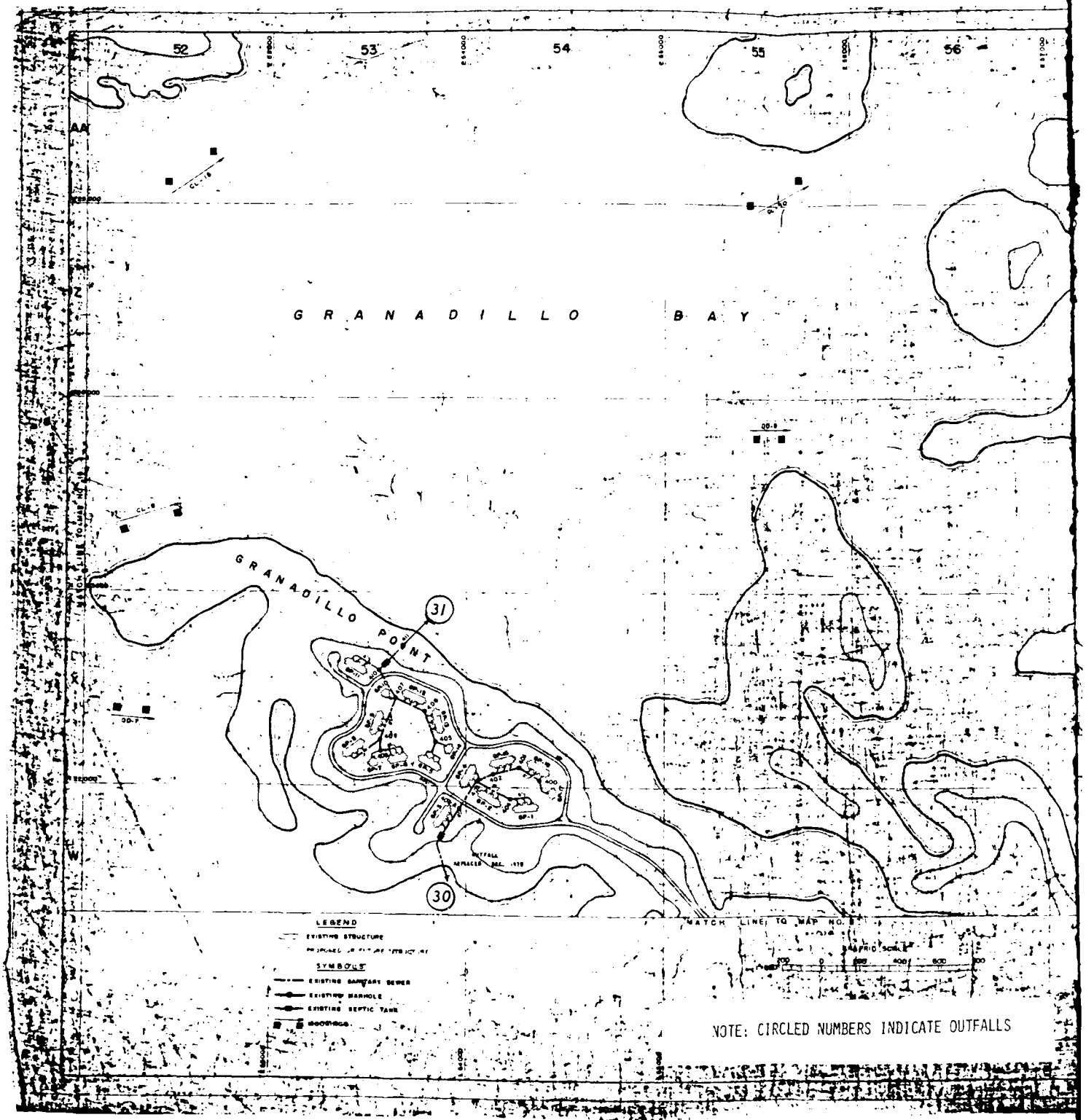
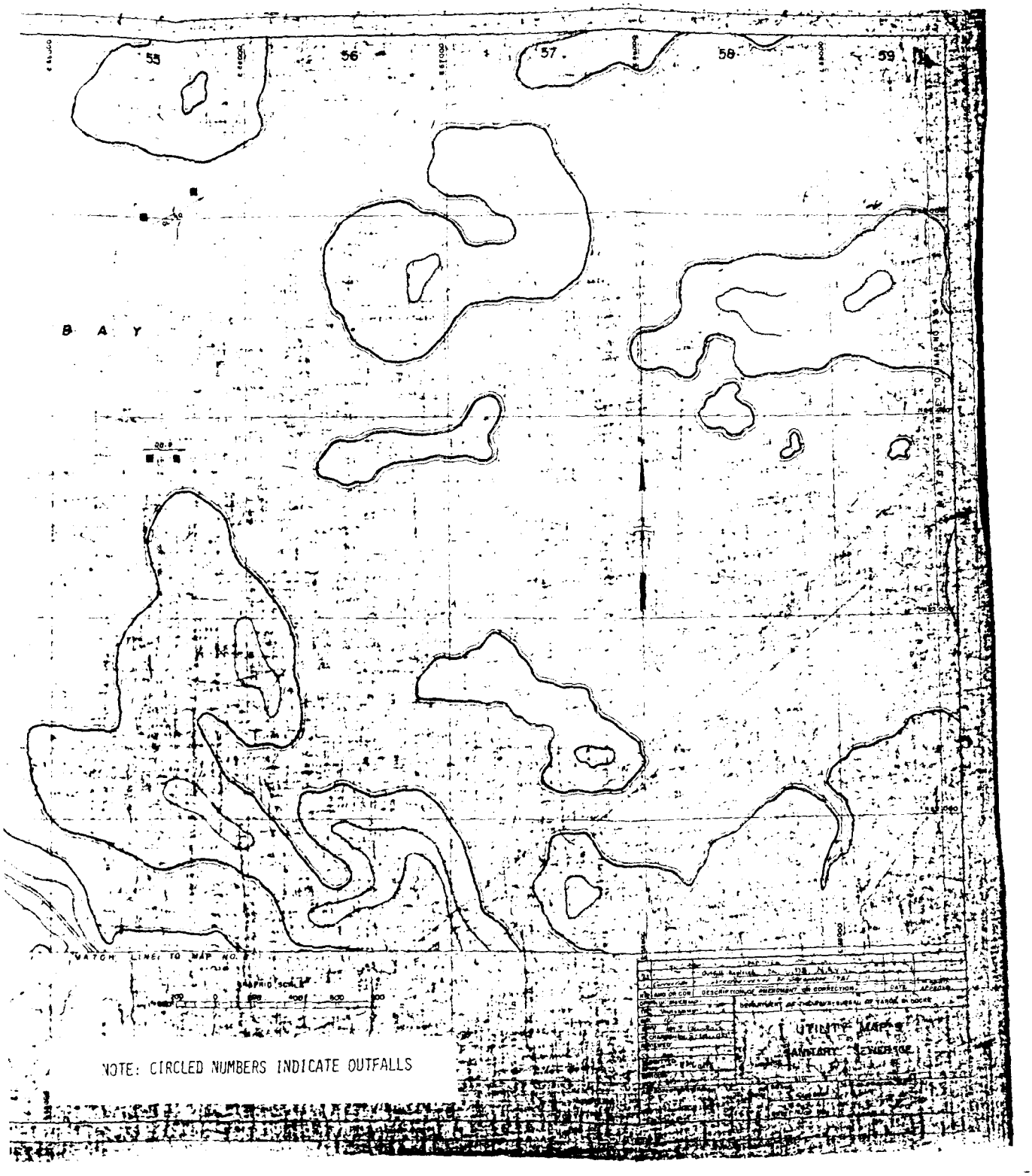
GUANTANAMO BAY
MATCH LINE
MATCH LINE TO MAP NO 15
NOTE: CIRCLED NUMBERS INDICATE OUTFALLS
GRAPHIC SCALE

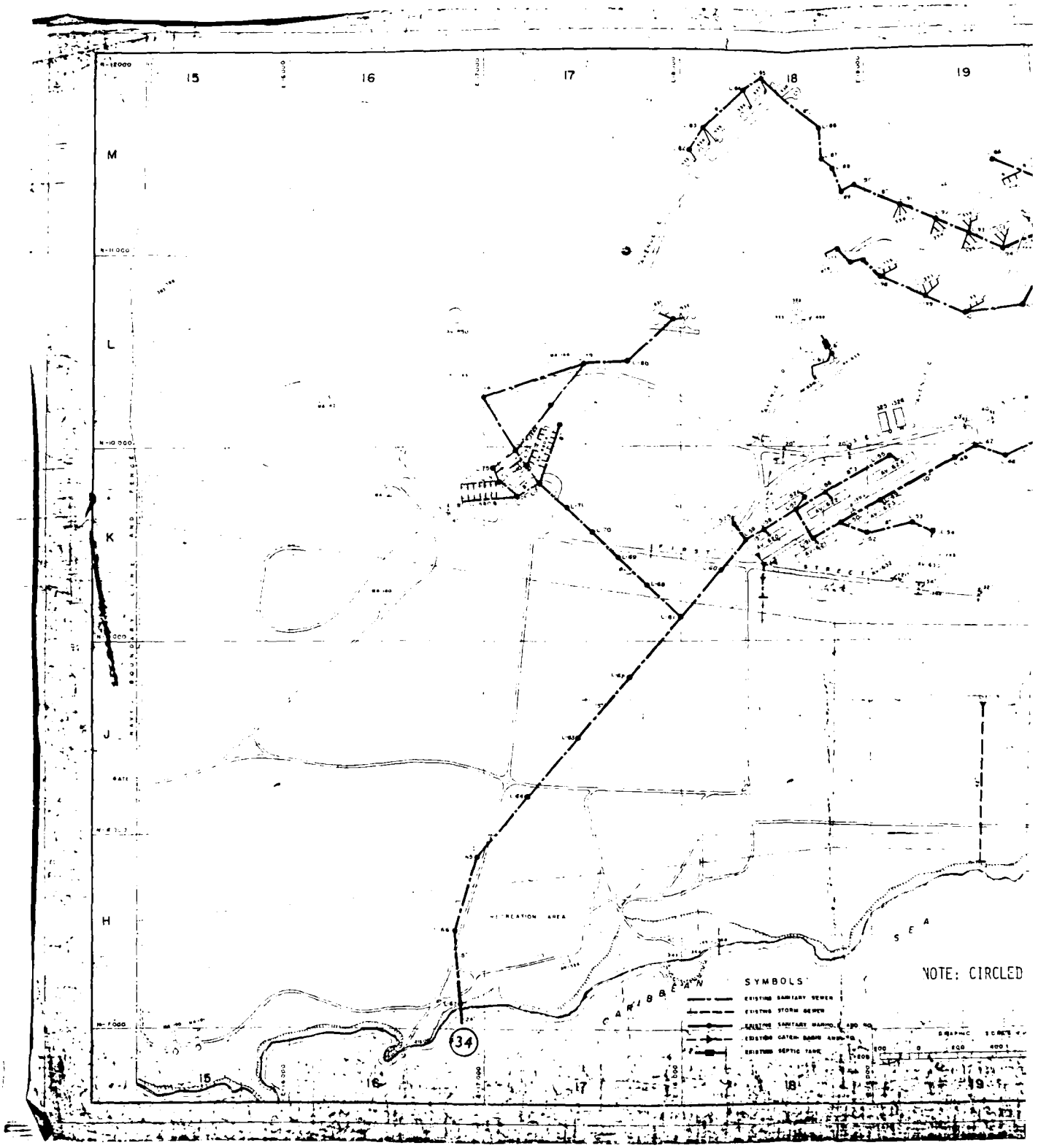

MATCH LINE TO MAP NO 15
48
49
80
81
MATCH LINE TO MAP NO 9
B A Y
P A N A M A
LEGEND
EXISTING STRUCTURE
SYMBOLS
EXISTING FRESH WATER MAIN
EXISTING GATE VALVE
EXISTING FIRE HYDRANT
WATER METER
EXISTING SANITARY SEWER
EXISTING MANHOLE
POLE
POWER TRANSFORMER
FLOOD LIGHT ON POLE OR PIPE
EXISTING SEPTING TANK
25
NOTE: CIRCLED NUMBERS INDICATE OUTFALLS
TO MAP NO 13
GRAPHIC SCALE
PT
CARAVELA
E Correction Corrected as of 25 JULY 1964
I Correction Corrected as of 31 December 1961
NO AMD OR CORR DESCRIPTION OF AMENDMENT OR CORRECTION DATE APPROVAL
DRWN
TR
CHK
SUPV
IN CHARGE
REVIEWED
SUBMITTED
APPROVED BY CNO
DEPARTMENT OF THE NAVY - BUREAU OF YARDS & DOCKS
UTILITIES MAP-14
ELECTRICAL POWER
WATER SUPPLY AND
SANITARY SEWERAGE
SCALE 1" = 800'
SHEET 30 OF 50
YBD DWG NO 927997

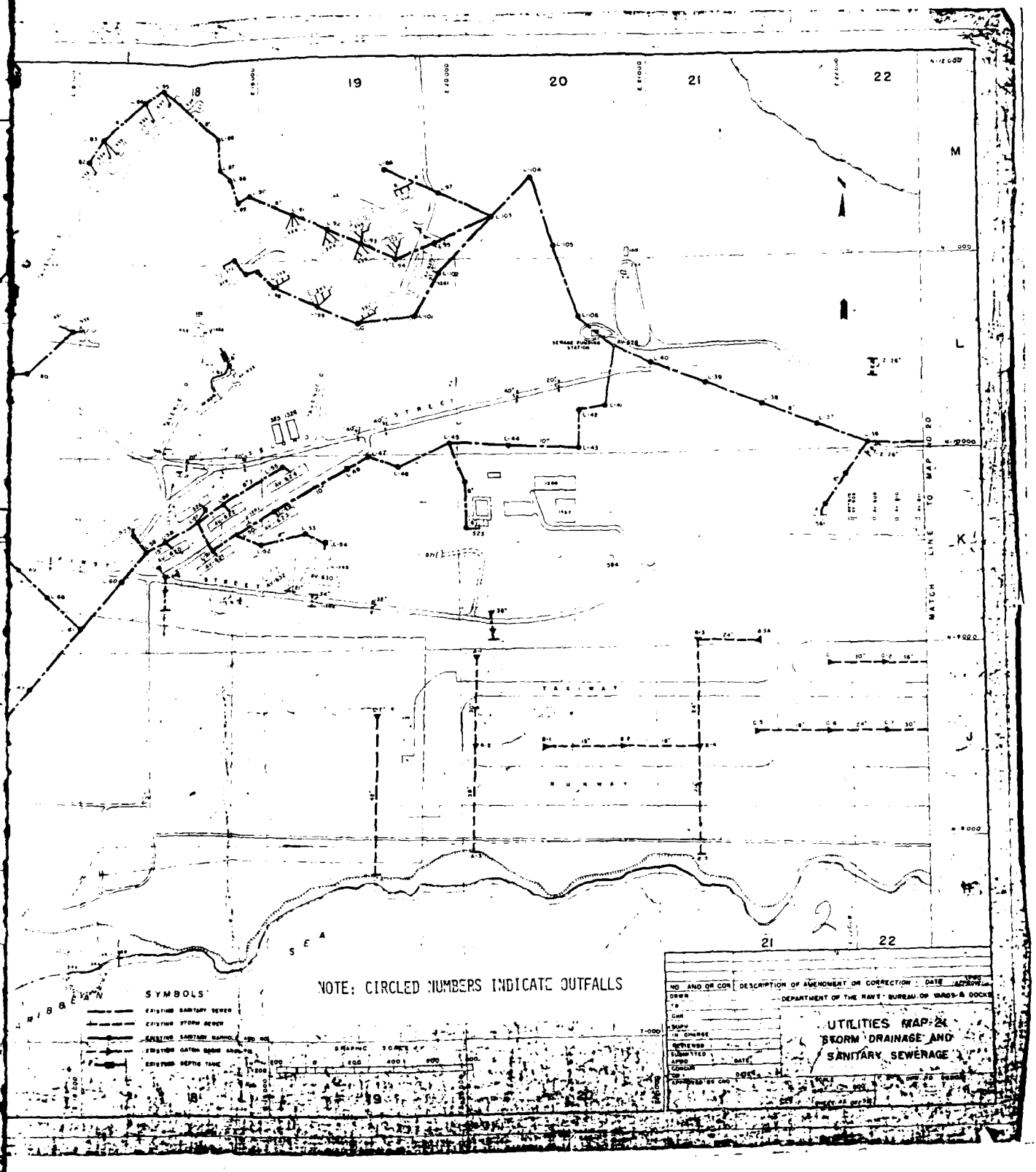

GRANADILLO COVE
BARGO POINT
CENTER
EAST
WEST
BARGO COVE
"NEW" 27
"OLD" 27
28
29
30
31
32
26
52
53
54
56
MATCH LINE TO MAP NO. 9
MATCH LINE TO MAP NO. 7
LASSITER TANK FARM
LEGEND
SYMBOLS
GRAPHIC SCALE
NOTE: CIRCLED NUMBERS INDICATE OUTFALLS

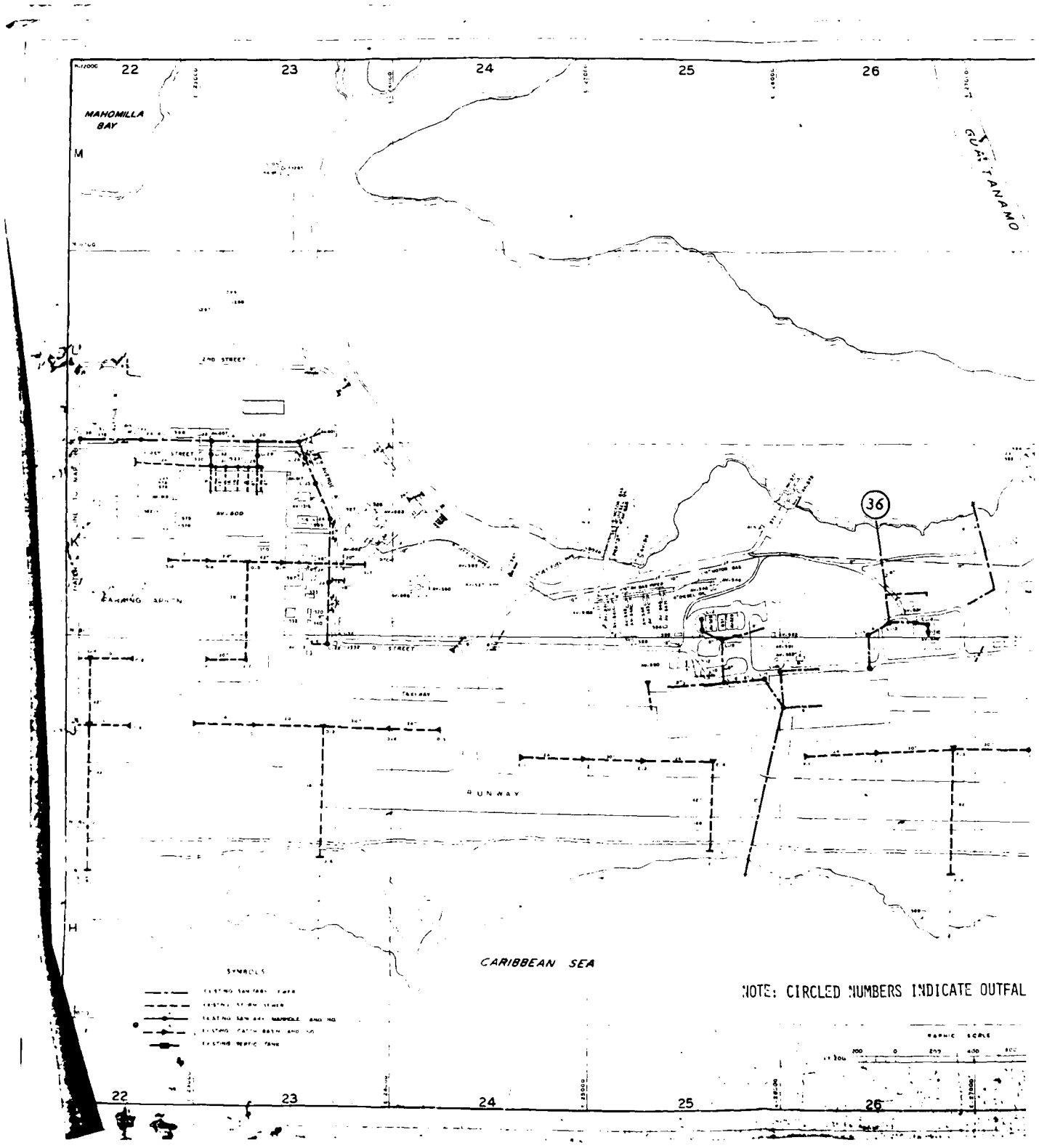

(31)
56
57
58
59
(32)
(33)
TO MAP NO 9
TO MAP NO 7
GRAPHIC SCALE
NOTE: CIRCLED NUMBERS INDICATE OUTFALLS
UTILITIES MAP-8
FUELING AND
SANITARY SEWERAGE

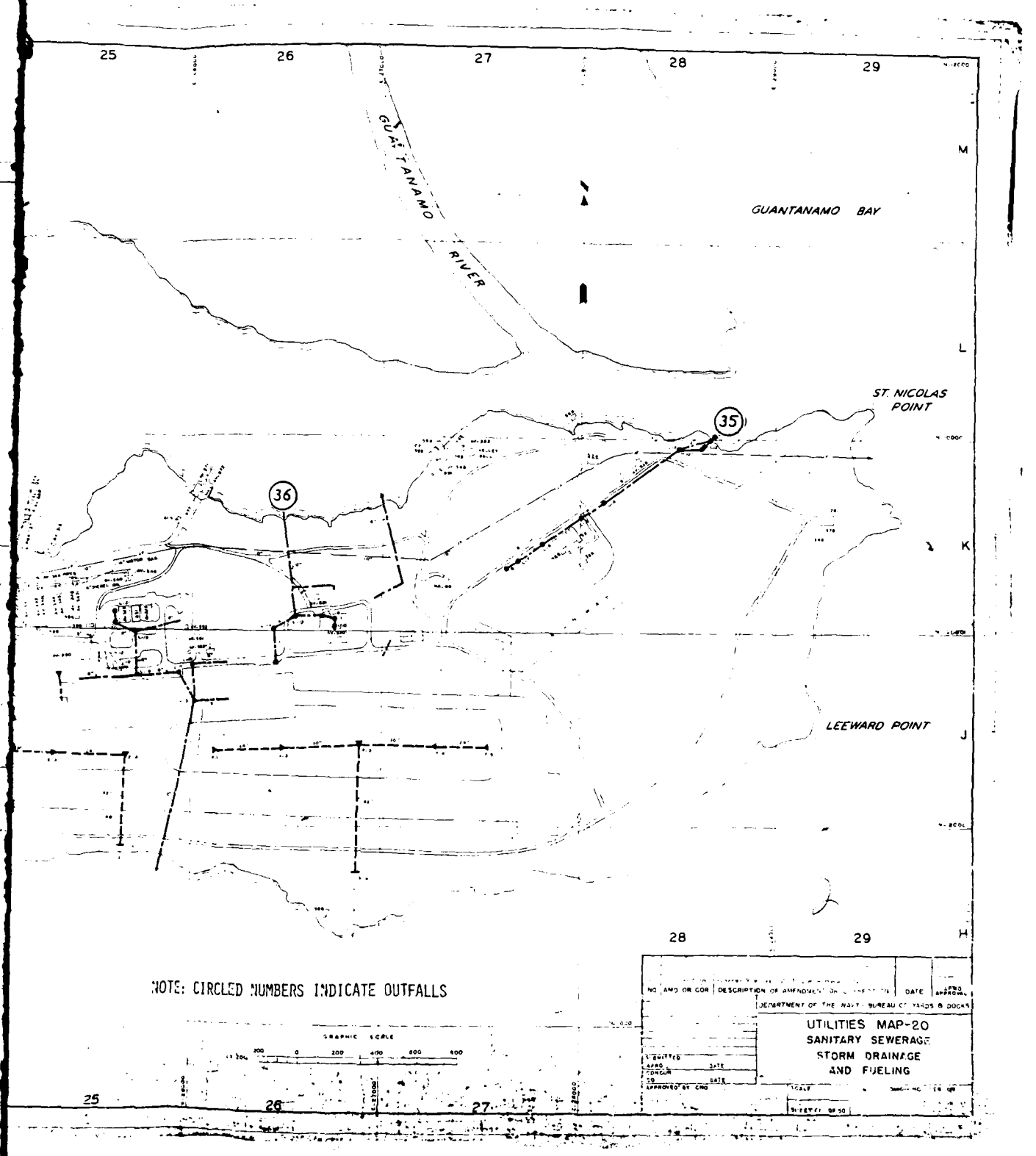

52
53
54
55
56
GRANADILLO BAY
GRANADILLO POINT
31
30
LEGEND
EXISTING STRUCTURE
SYMBOLS
EXISTING SANITARY SEWER
EXISTING MANHOLE
EXISTING SEPTIC TANK
MATCH LINE TO MAP NO. 5
NOTE: CIRCLED NUMBERS INDICATE OUTFALLS

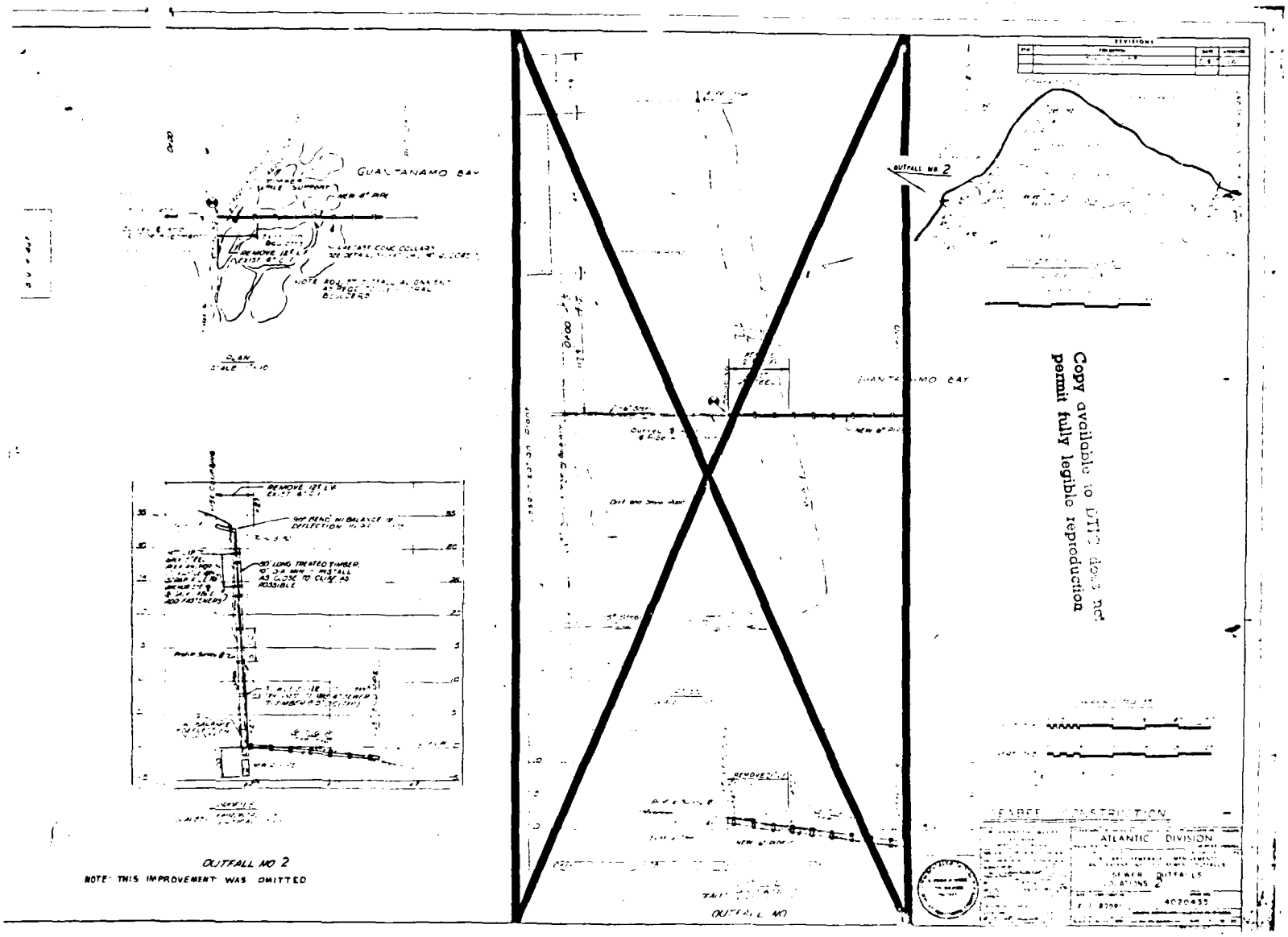

55
56
57
58
59
B A Y
NOTE: CIRCLED NUMBERS INDICATE OUTFALLS

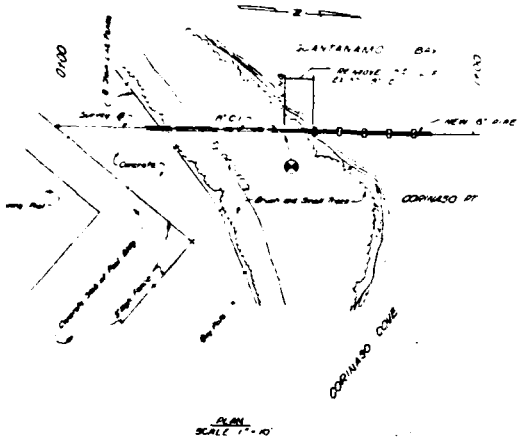

15
16
17
18
19
M
L
K
J
H
RECREATION AREA
CARIBBEAN SEA
SYMBOLS
NOTE: CIRCLED
34


19
20
21
22
M
L
K
J
MATCH LINE TO MAP NO 20
TAXIWAY
RUNWAY
SEA
SYMBOLS
NOTE: CIRCLED NUMBERS INDICATE OUTFALLS
DESCRIPTION OF AMENDMENT OR CORRECTION
DEPARTMENT OF THE NAVY · BUREAU OF YARDS & DOCKS
UTILITIES MAP 21
STORM DRAINAGE AND
SANITARY SEWERAGE

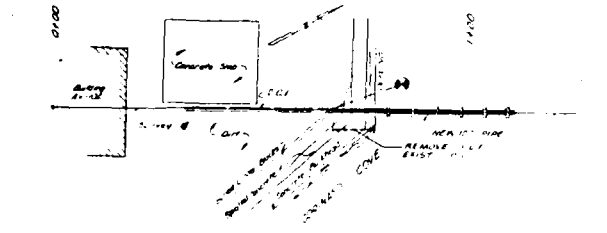

22
23
24
25
26
MAHOMILLA BAY
GUANTANAMO
M
K
H
36
RUNWAY
CARIBBEAN SEA
NOTE: CIRCLED NUMBERS INDICATE OUTFAL


25
26
27
28
29
M
L
K
J
H
GUANTANAMO BAY
GUANTANAMO RIVER
ST. NICOLAS POINT
LEEWARD POINT
35
36
NOTE: CIRCLED NUMBERS INDICATE OUTFALLS
GRAPHIC SCALE
200 0 200 400 600 800
NO. AMD OR COR
DESCRIPTION OF AMENDMENT OR CORRECTION
DATE
APPD
DEPARTMENT OF THE NAVY - BUREAU OF YARDS & DOCKS
UTILITIES MAP-20
SANITARY SEWERAGE
STORM DRAINAGE
AND FUELING
SUBMITTED
DATE
CONCUR
DATE
APPROVED BY CNO
SCALE
SHEET 1 OF 50

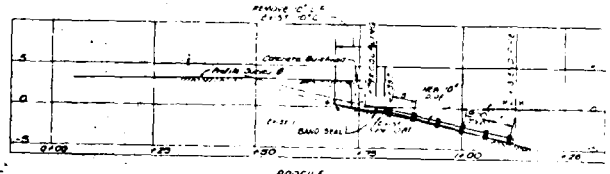




PLAN
SCALE 1" = 10'

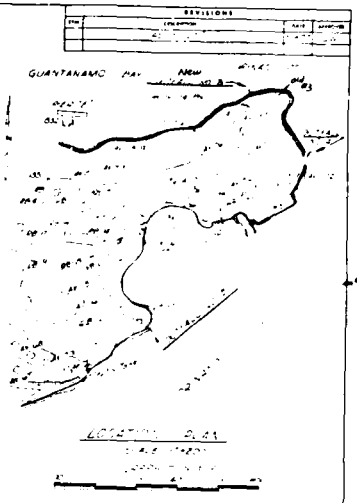


PLAN
SCALE 1" = 10'

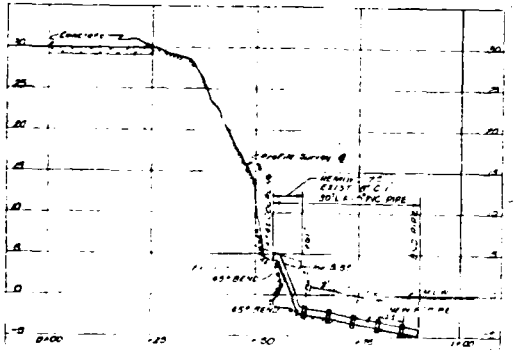


PROFILE
SCALES HORIZONTAL 1" = 10'
VERTICAL 1" = 5'

OUTFALL NO. 6

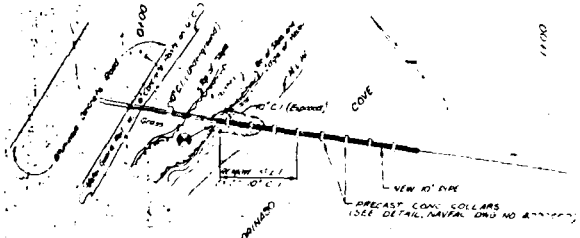


LOCATION PLAN
SCALE 1" = 200'

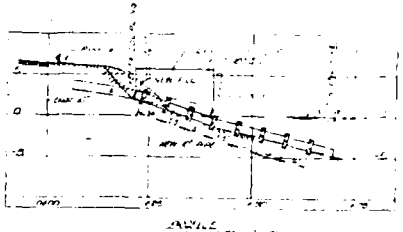


PROFILE
HORIZONTAL
SCALES VERTICAL

OUTFALL NO. 5



PLAN
SCALE 1" = 10'



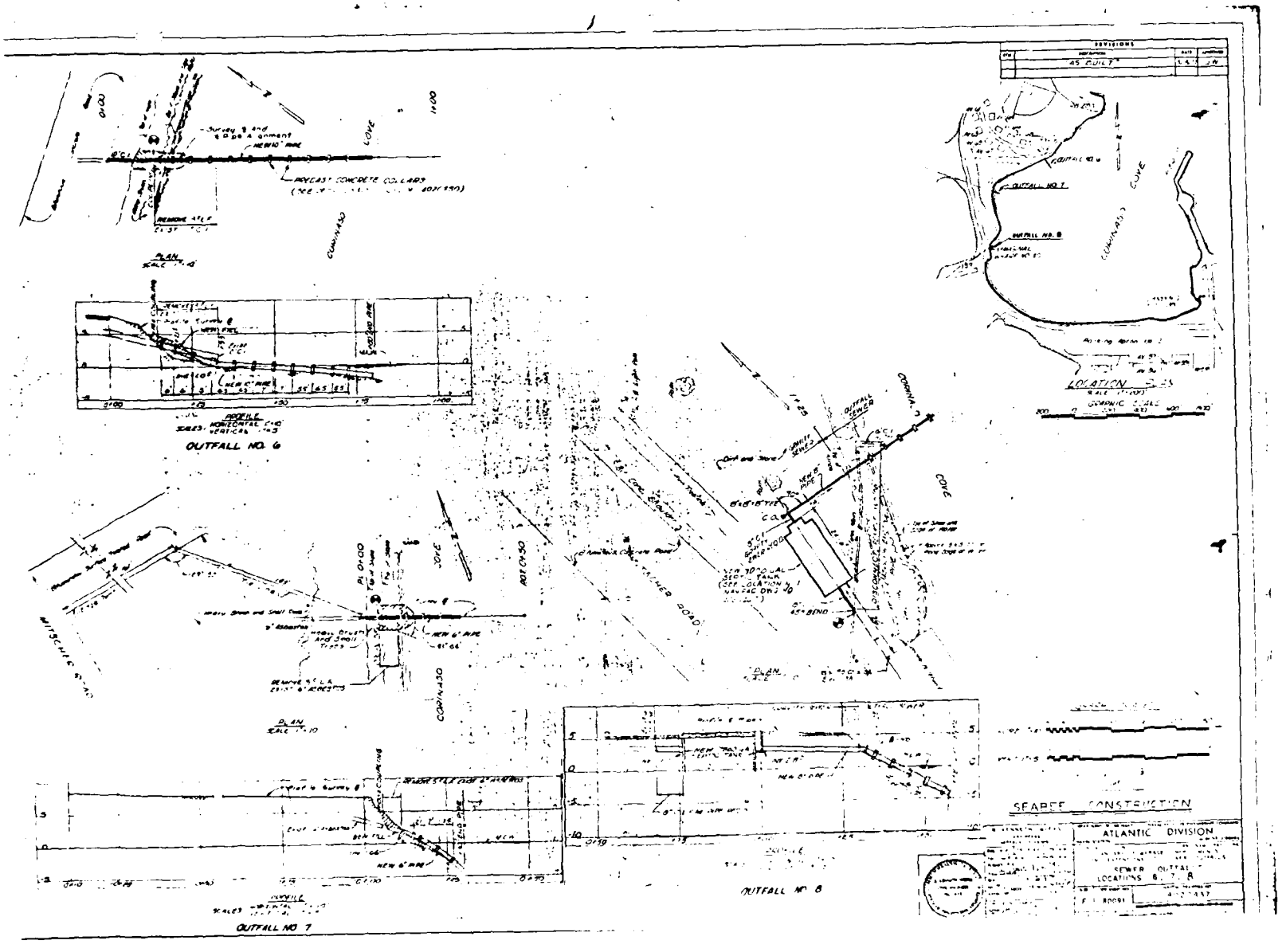
PROFILE
SCALES

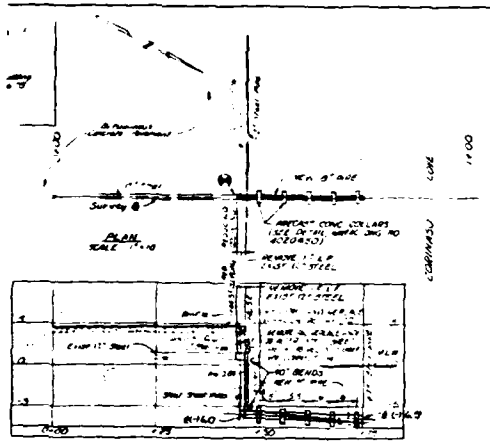
OUTFALL NO. 5

SEABEE CONSTRUCTION

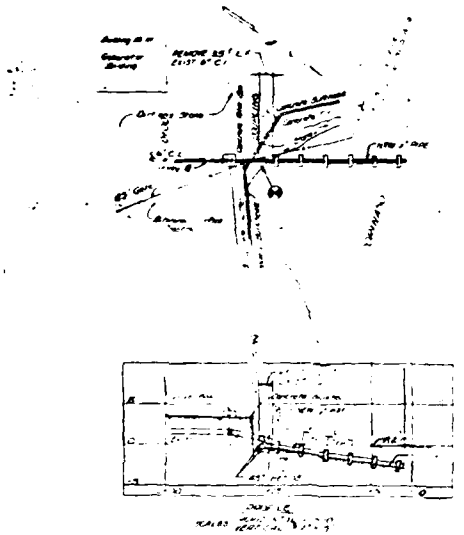
ATLANTIC DIVISION

SEWER OUTFALLS
LOCATIONS 4 AND 5

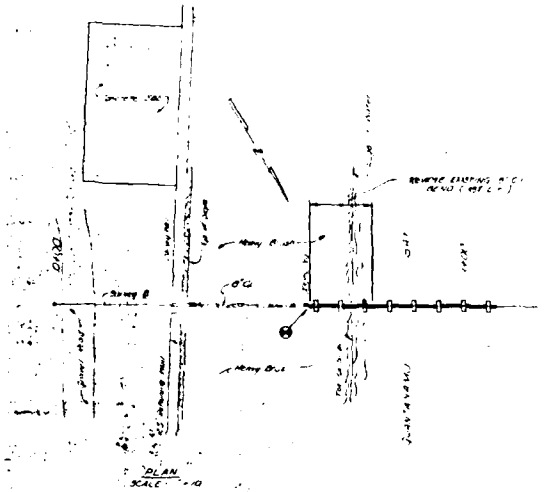

OUTFALL NO. 6
OUTFALL NO. 7
OUTFALL NO. 8
LOCATION
SEABEE CONSTRUCTION
ATLANTIC DIVISION
SEWER OUTFALL LOCATIONS 6, 7, 8

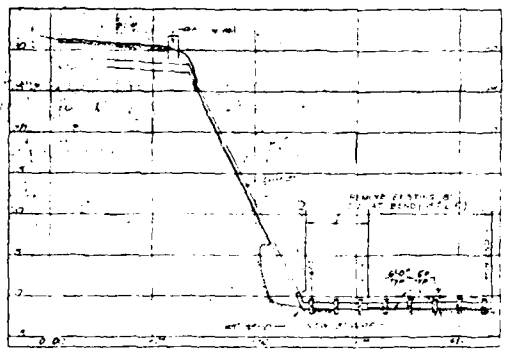


OUTFALL NO. 10

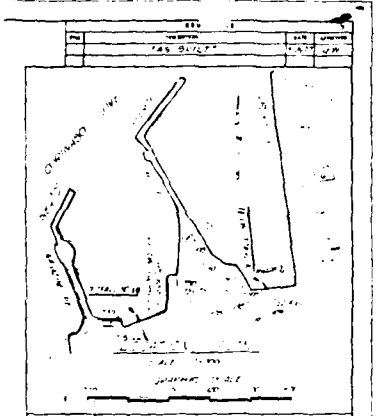


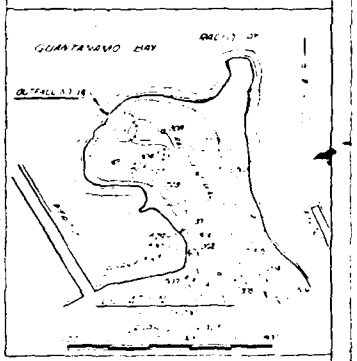
OUTFALL NO. 11

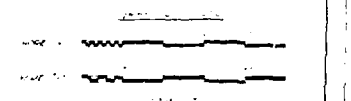




OUTFALL NO. 14



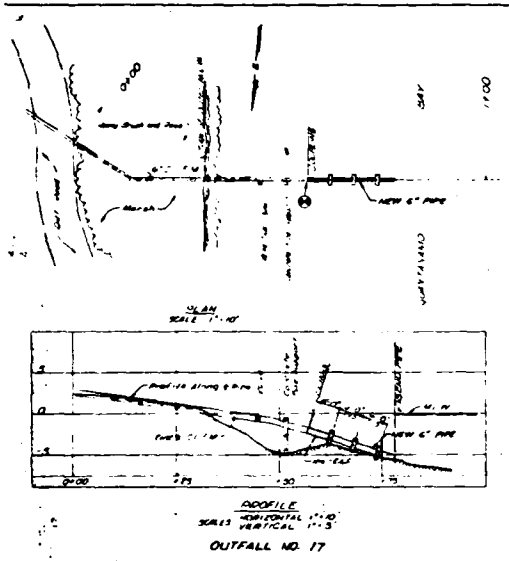




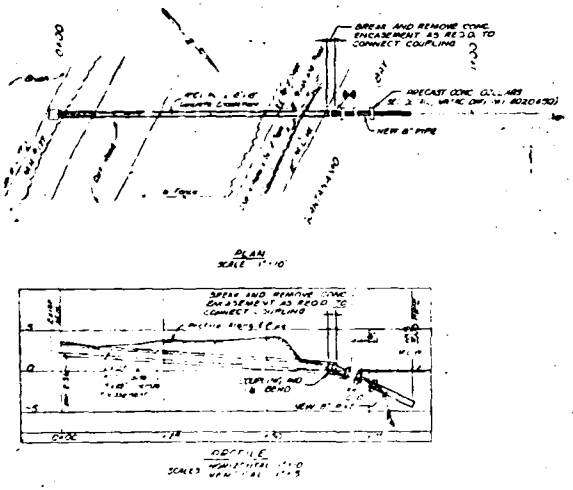
SEABEE CONSTRUCTION

ATLANTIC DIVISION

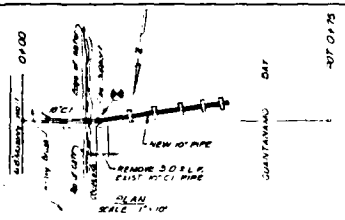
SEWER OUTFALLS LOCATIONS 10 TO 14

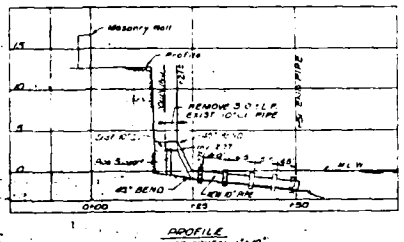


OUTFALL NO. 17

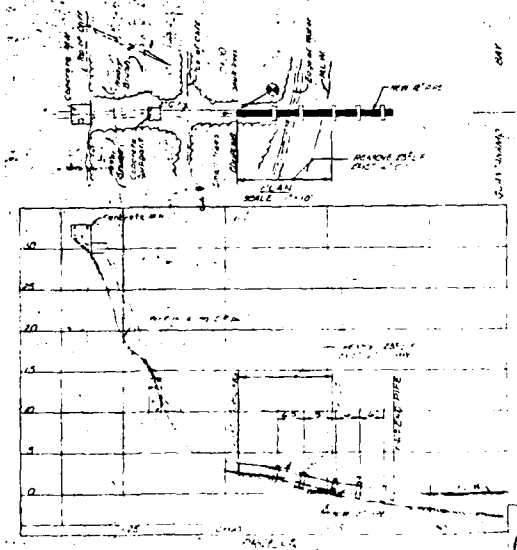


OUTFALL NO 18

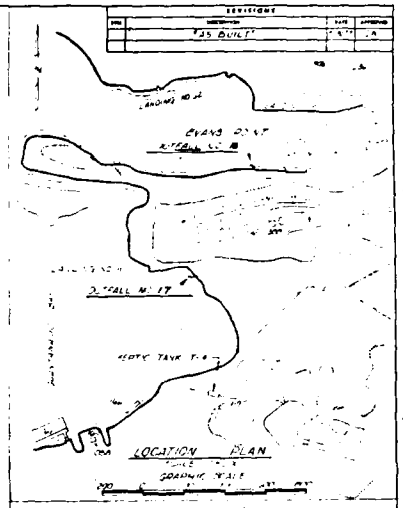


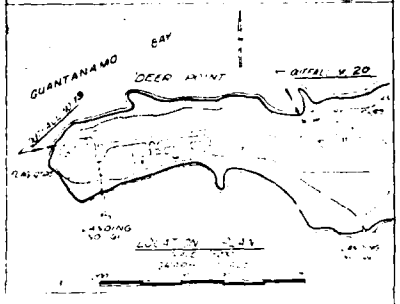


OUTFALL NO. 19



OUTFALL NO. 20

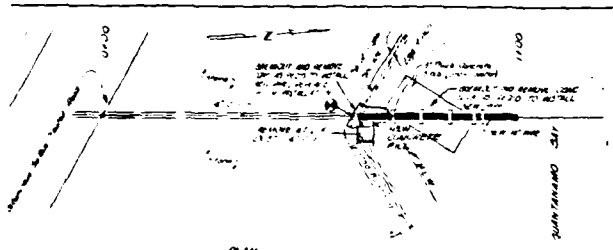




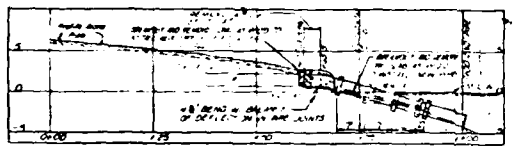
SEABEE CONSTRUCTION

ATLANTIC DIVISION

SEWER OUTFALLS
LOCATIONS OF OUTFALLS NO. 17, 18, 19 AND 20

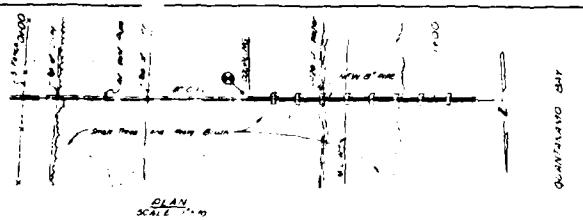


PLAN

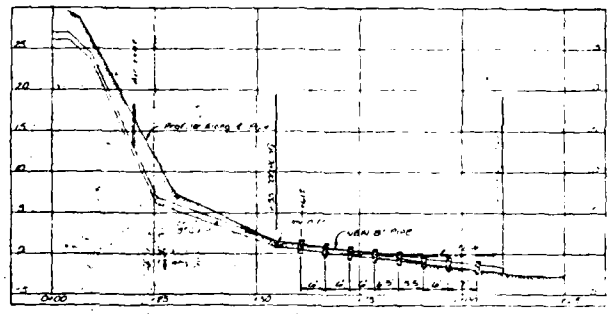


PROFILE
SCALES HORIZONTAL 1" = 10'
VERTICAL 1" = 5'

OUTFALL NO 21

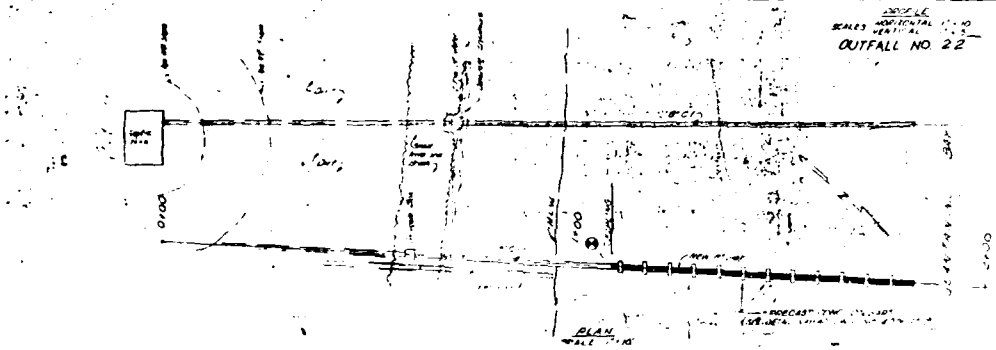


PLAN
SCALE 1" = 10'

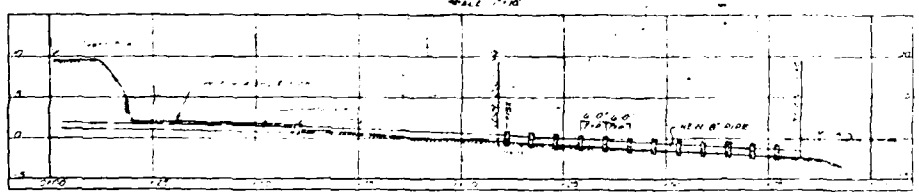


PROFILE
SCALES HORIZONTAL 1" = 10'
VERTICAL 1" = 5'

OUTFALL NO 22

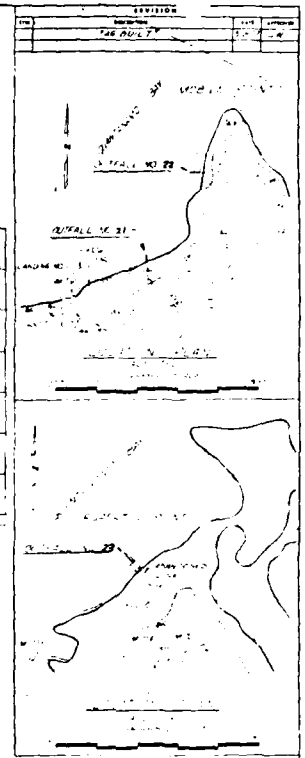


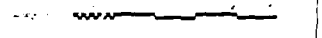
PLAN



PROFILE
SCALES HORIZONTAL 1" = 10'
VERTICAL 1" = 5'

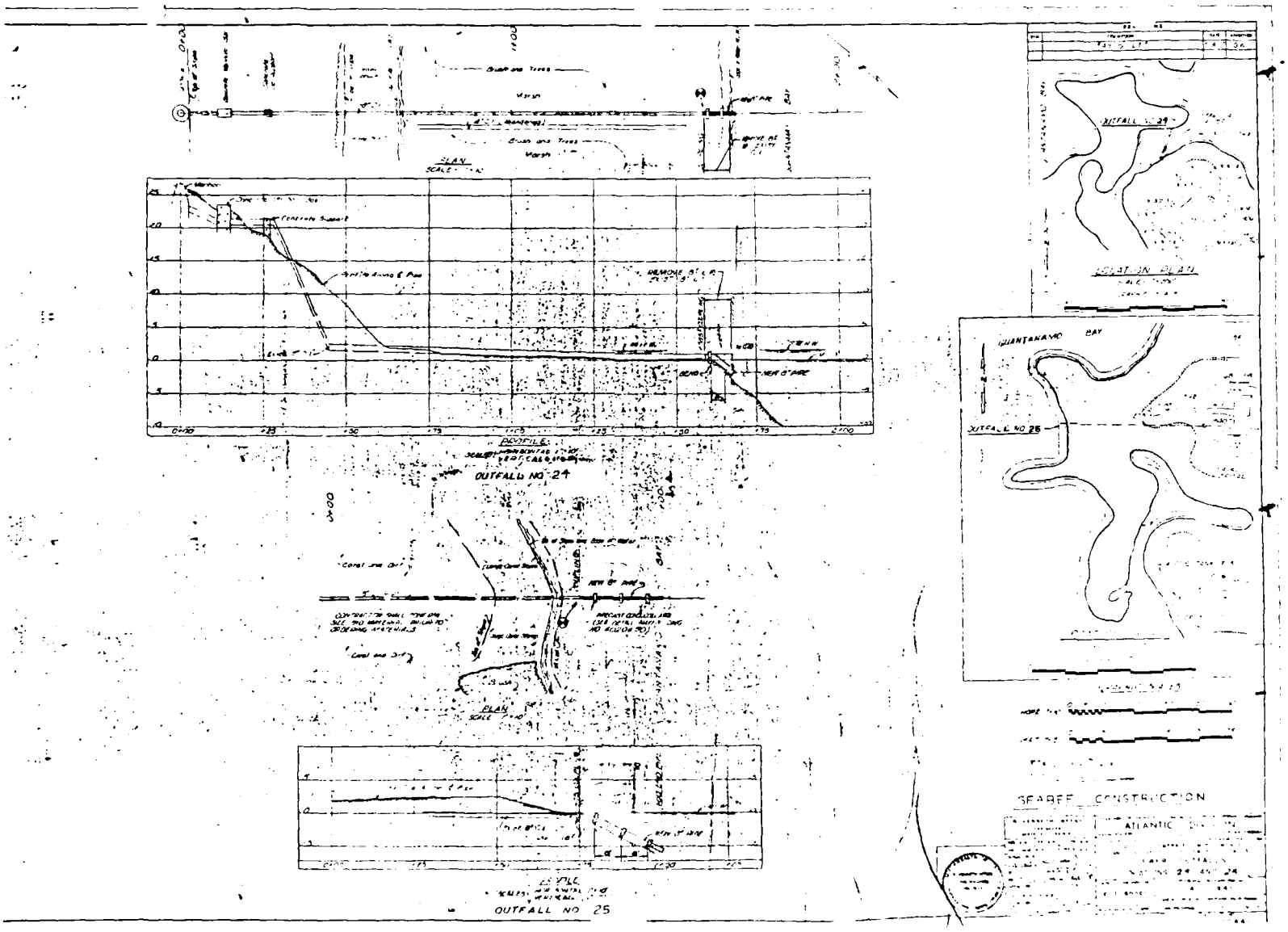
OUTFALL NO 23

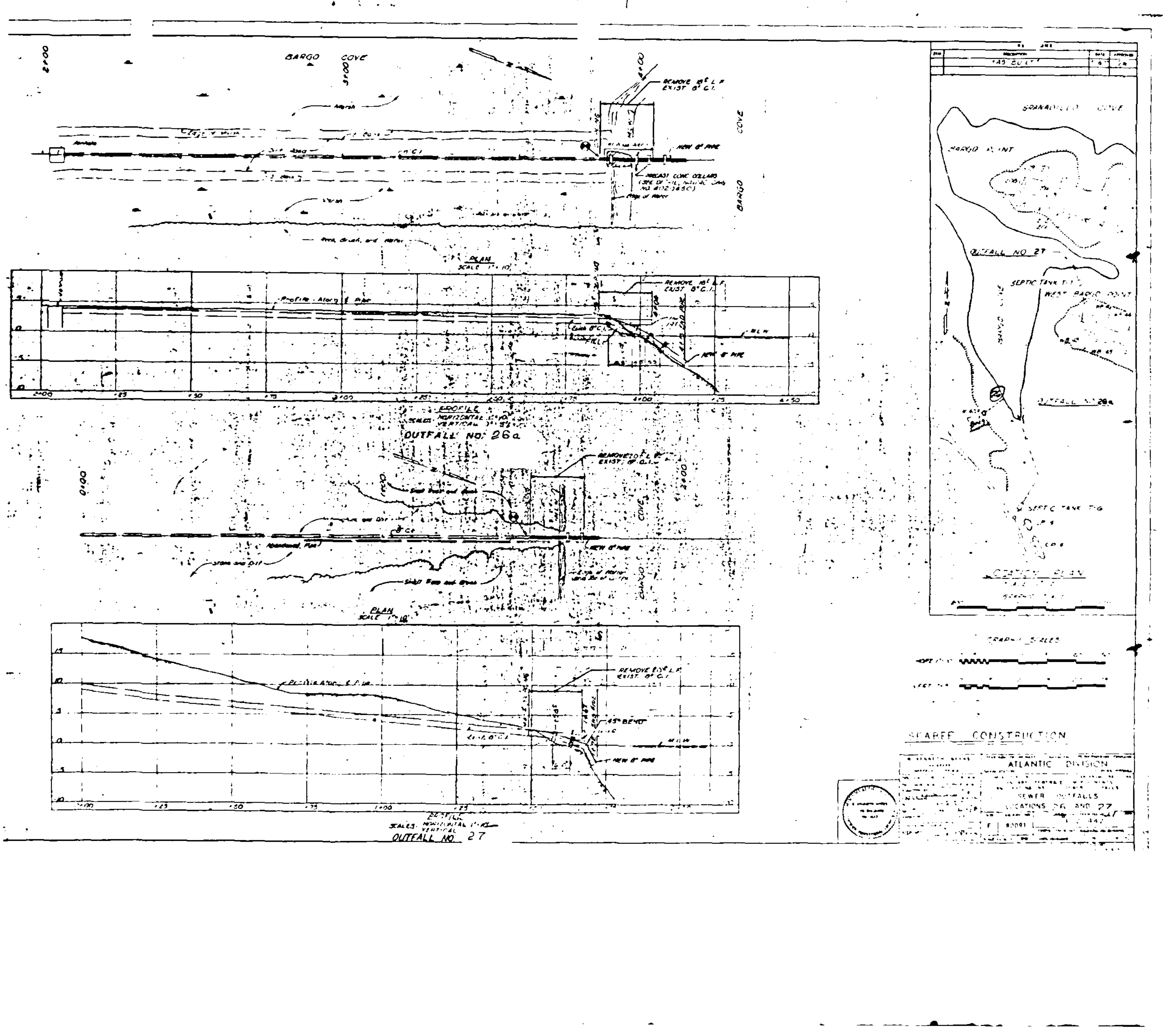


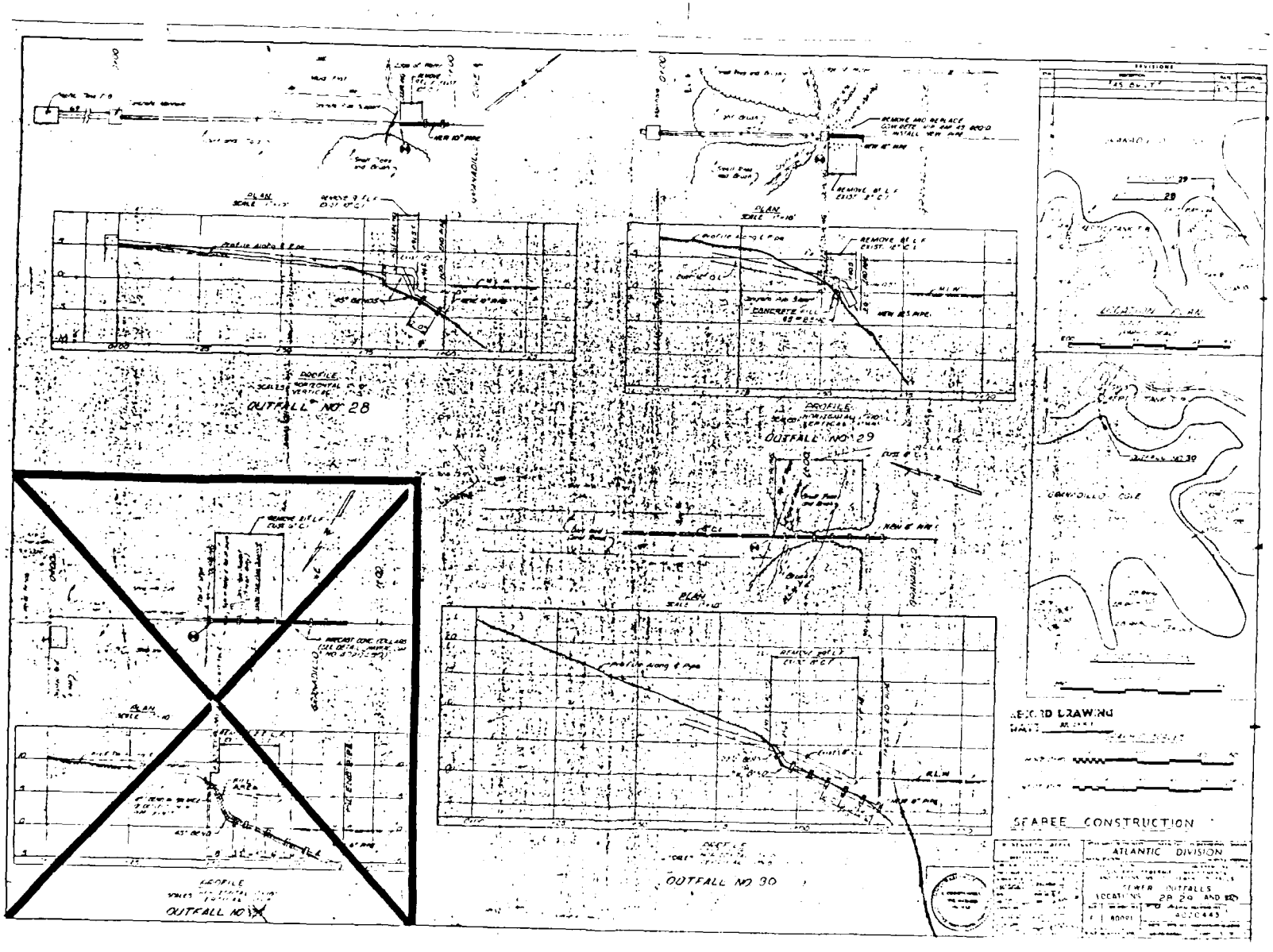


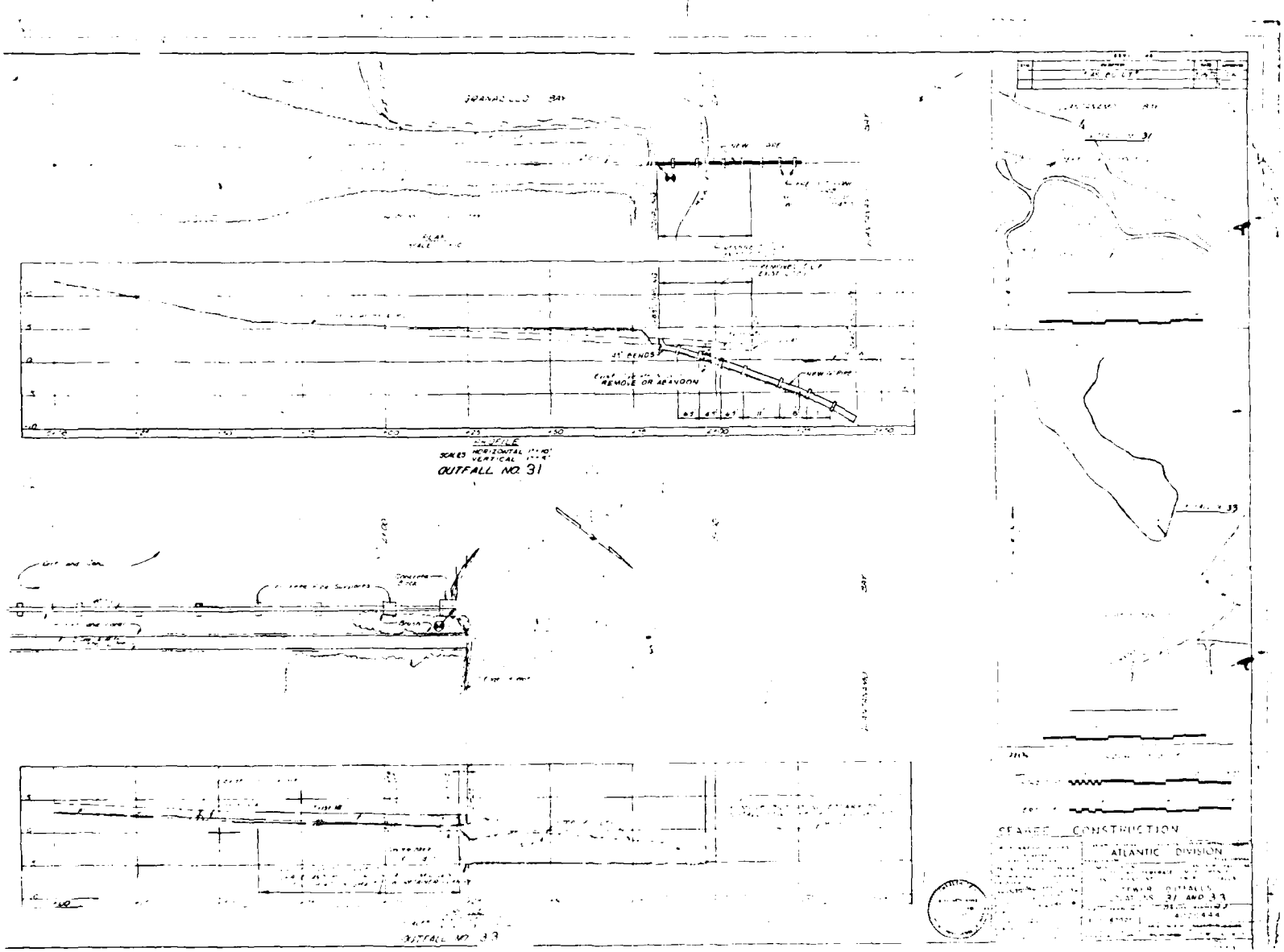
SEABEE CONSTRUCTION

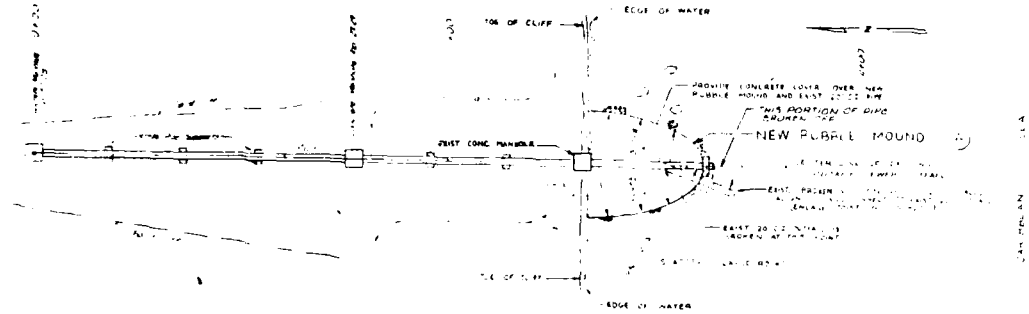
ATLANTIC DIVISION


OUTFALL NO 24
OUTFALL NO 25
OUTFALL NO 29
GUANTANAMO BAY
SEABEE CONSTRUCTION

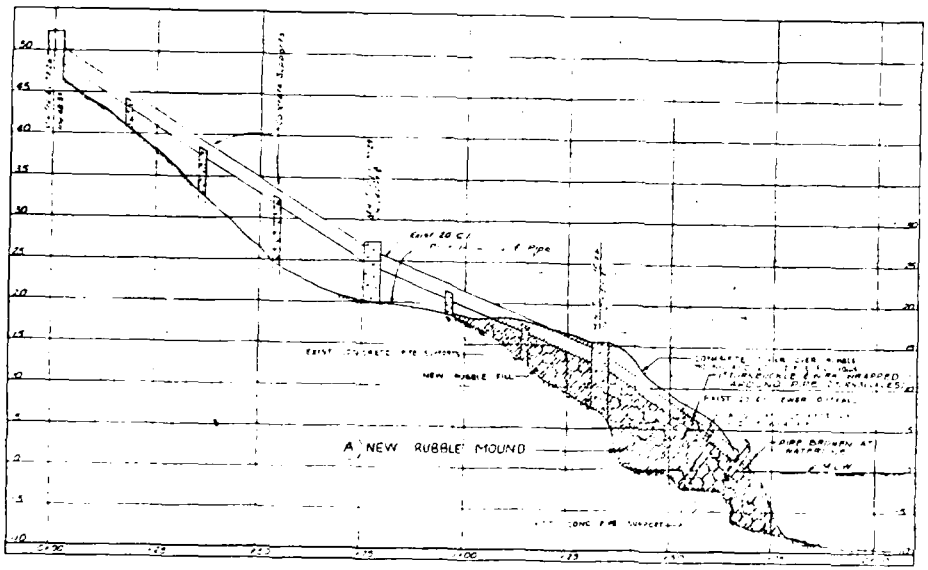

BARGO COVE
REMOVE 18" L.F. EXIST. 8" C.I.
NEW 8" PIPE
PRECAST CONC COLLARS
PLAN
PROFILE
OUTFALL NO. 26a
REMOVE 20' L.F. EXIST. 8" C.I.
PLAN
45° BEND
PROFILE
OUTFALL NO. 27
GRANADILLO COVE
BARGO POINT
OUTFALL NO. 27
SEPTIC TANK
WEST BARGO POINT
OUTFALL NO. 26a
LOCATION PLAN
GRAPHIC SCALES
SEABEE CONSTRUCTION
ATLANTIC DIVISION
SEWER OUTFALLS
LOCATIONS 26 AND 27
"AS BUILT"


OUTFALL NO 28
OUTFALL NO 29
OUTFALL NO 30
OUTFALL NO 31
LOCATION PLAN
SEABEE CONSTRUCTION
ATLANTIC DIVISION

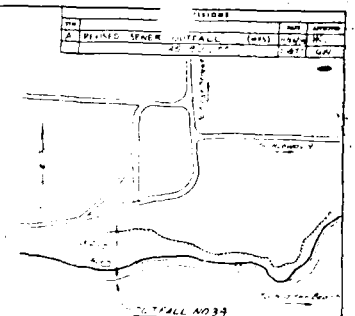

OUTFALL NO. 31
OUTFALL NO. 33
SEWER CONSTRUCTION
ATLANTIC DIVISION
SEWER OUTFALLS
SHEETS 31 AND 33



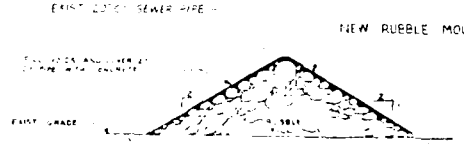
PLAN
SCALE 1"=10'



PROFILE
SCALES HORIZONTAL 1"=10'
VERTICAL 1"=5'
OUTFALL NO 34



OUTFALL NO 34
CARIBBEAN SEA
LOCATION PLAN
SCALE AS SHOWN
GRAPHIC SCALE

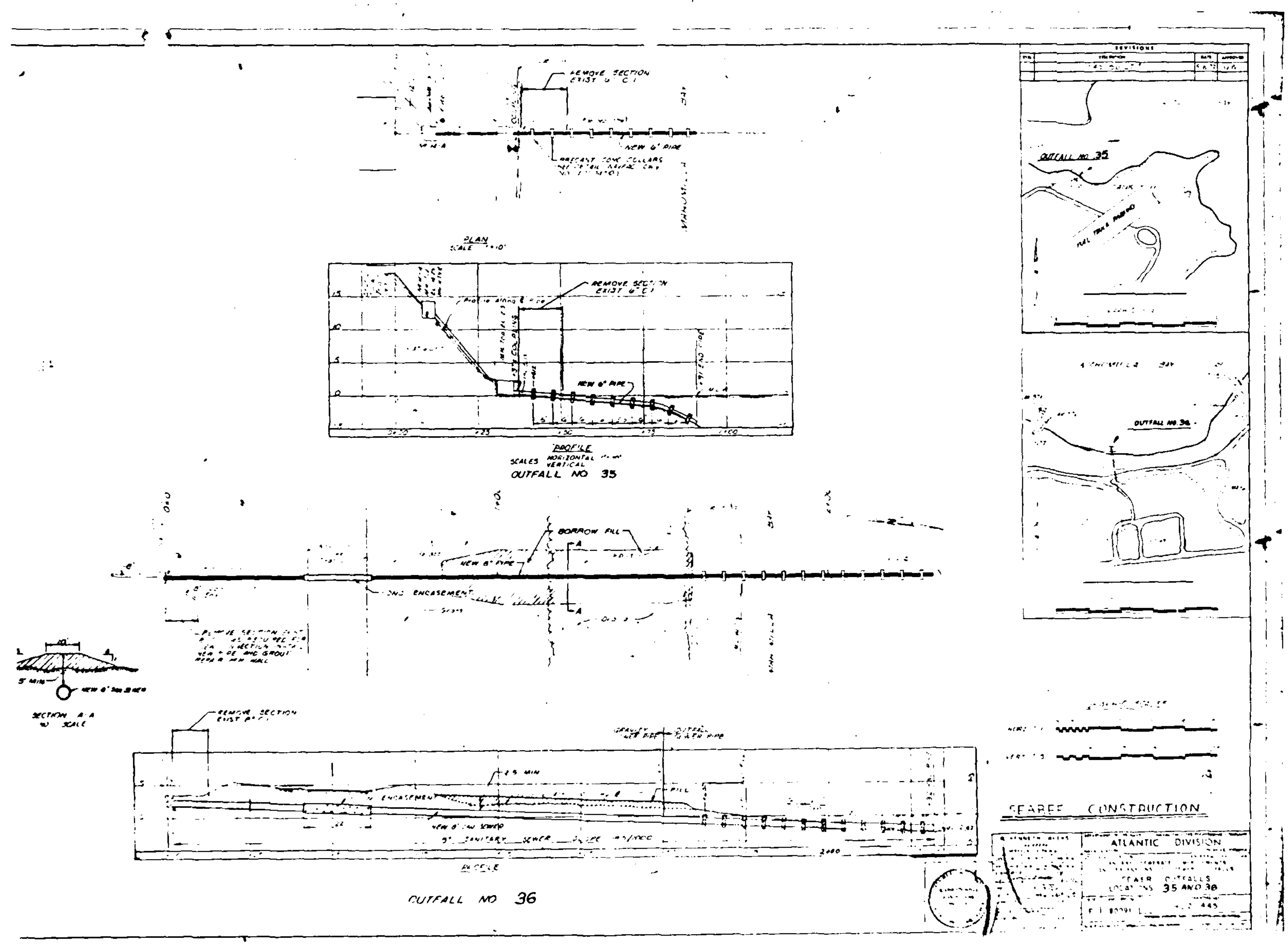


TYPICAL SECTION-RUBBLE MOUND

NOTE

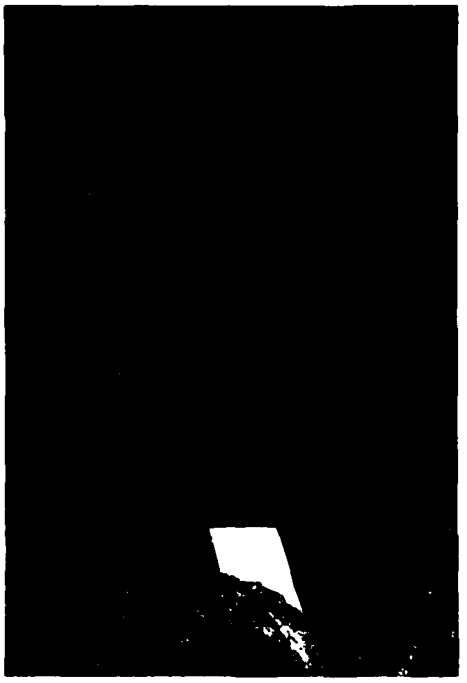
RECORD DRAWING
DATE

ATLANTIC DIVISION
SEWER OUTFALL
LOCATION 34


REMOVE SECTION EXIST 6" C.I.
NEW 6" PIPE
PRECAST CONC COLLARS
PLAN
REMOVE SECTION EXIST 6" C.I.
NEW 6" PIPE
PROFILE
SCALES HORIZONTAL
VERTICAL
OUTFALL NO 35
BORROW FILL
NEW 6" PIPE
CONC ENCASEMENT
SECTION A-A
NO SCALE
5' MIN
NEW 6" SOIL SEWER
REMOVE SECTION EXIST 6" C.I.
2.5' MIN
ENCASEMENT
FILL
NEW 6" C.I. SEWER
SANITARY SEWER
PROFILE
OUTFALL NO 36
OUTFALL NO 35
FUEL TANK PARKING
OUTFALL NO 36
REVISIONS
SEABEE CONSTRUCTION
ATLANTIC DIVISION
REPAIR OUTFALLS
LOCATIONS 35 AND 36

Outfall No. 1

Outfall No. 3



Outfall No. 4 is not used because the building is not there anymore

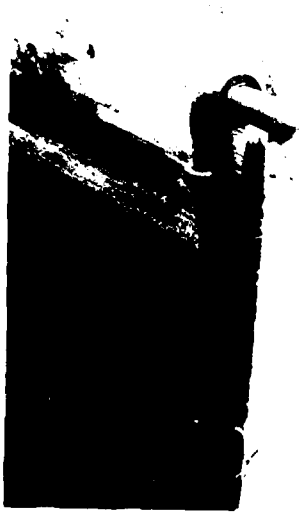
This is another outfall in vicinity of outfall No. 5

Outfall No. 6

Outfall No. 7

Outfall No. 8

Outfall No. 9
only this one was found and the end is just below the water surface



Outfall No. 12

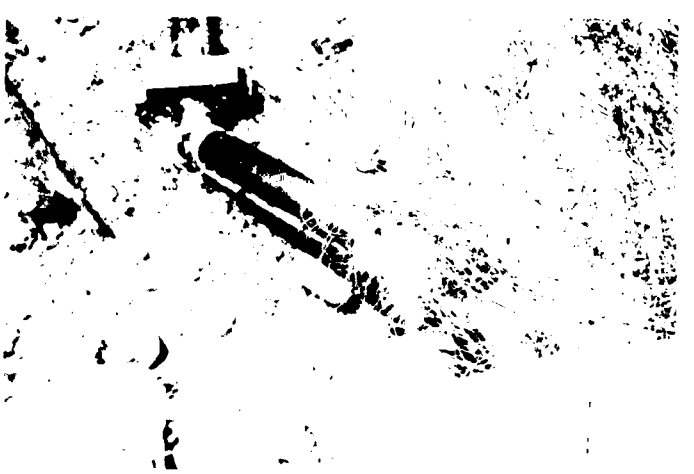
Outfall No. 14
does not appear to be used

Outfall No. 15

Outfall No. 18

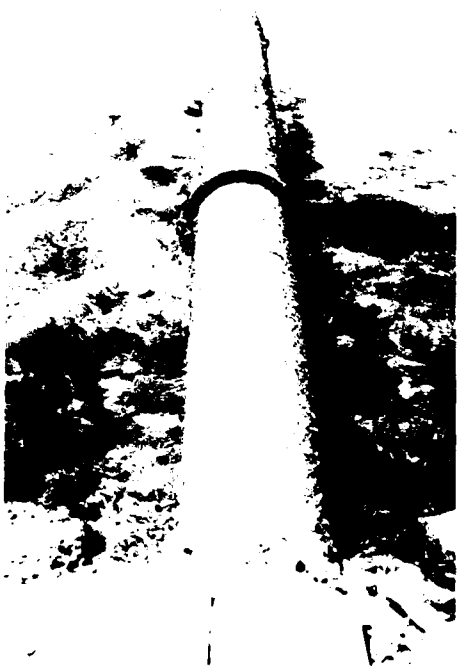
the connection of the plastic pipe to the C.I. has failed

These two pictures are of outfall No. 19



Outfall No. 20
is disconnected at the plastic pipe and leaking

Outfall No. 21
has a section cut out of the plastic pipe



Outfall No. 23
is a new C.I. outfall

Outfall No. 25
this outfall ends where
the small wave is
breaking

Outfall No. 26
is from the brig

Outfall No. 26a

Outfall No. 28

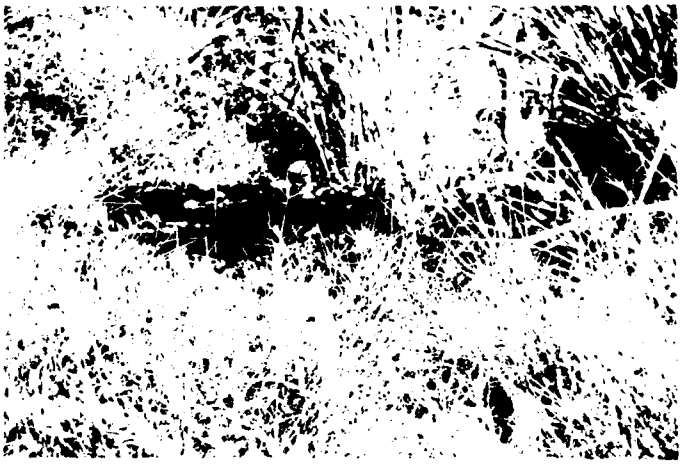
Outfall No. 29

this separation occurs just before outfall No. 29

Outfall No. 30

as can be seen, this coupling of the plastic pipe to the C.I. pipe is going to slip apart soon

Outfall No. 31
the outfall is intact



but this tank up the line is overflowing

Outfall No. 32
the outfall does not
reach the water

Outfall No. 33
the outfall ends above the
water and there is a very large deposit of sludge

Outfall No. 34

The pipe is broken prior to entering the water

Outfall No. 35

Outfall No. 36

END

DATE
FILMED

6-86

DTIC